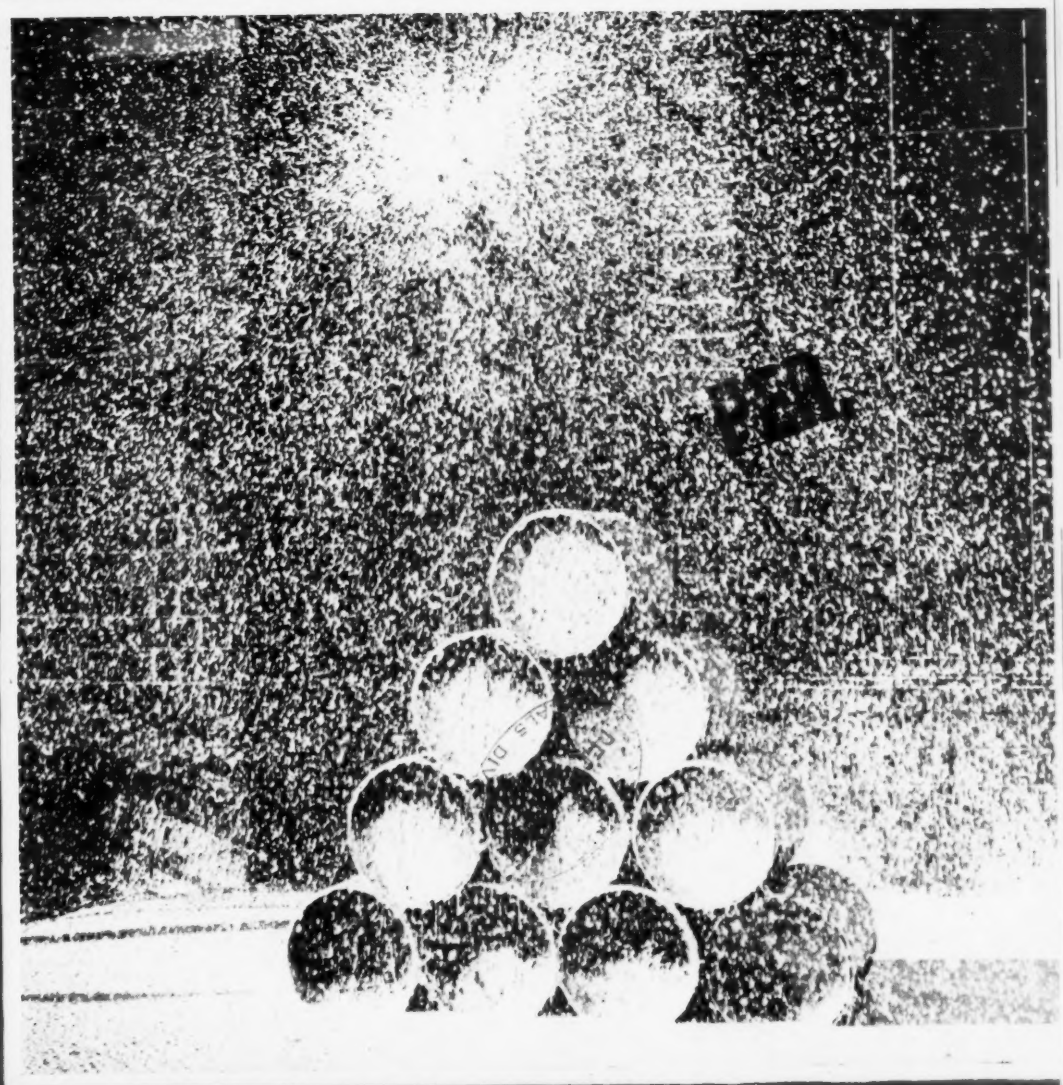
Occupational HAZARDS

THERE'S PROFIT IN PREVENTION

DECEMBER 1947

SAFETY NEWS



IN THIS ISSUE:

DUST CONTROL IN FOUNDRIES

FLOOR MAINTENANCE

FIRE FIGHTING WITH WETTER WATER

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*Installation at The Hobart Manufacturing Co., Troy, Ohio

"TIGHT SQUEEZE"

...solved by
KIRK & BLUM ENGINEERS

• A dust problem was slowing production; maintenance costs were rising steadily. Something had to be done, but factory space was at a premium. KIRK & BLUM Engineers were called in, went to work and solved the problem.

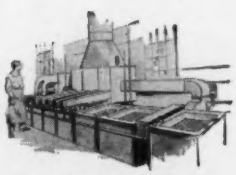
The resulting installation occupies very little space . . . the main suction pipe, fan, discharge pipe and collector all are located in a small court between buildings in this noted electrical manufacturer's plant*.

On job, after job, KIRK & BLUM Engineers display ingenuity born of more than 40 years' experience and continuous research. Put this skill to work in your plant.

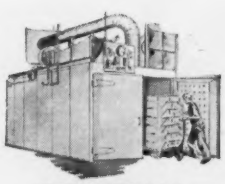
Call in K & B Engineers for a survey of your dust-collecting problems. Write for illustrated booklets showing K & B installations in your industry. Address: Kirk & Blum Manufacturing Company, 2802 Spring Grove Ave., Cincinnati 25, Ohio.

DUST CONTROL SYSTEMS

SHEET METAL FABRICATION



FUME REMOVAL SYSTEMS



INDUSTRIAL OVENS

KIRK AND BLUM
Dust Control

AN ORGANIZATION OF ENGINEERS & MECHANICS

DEC 15 1947

Have you seen them?

Saftopedics by Iron Age

a revolutionary line of STEEL TOE SAFETY SHOES

Those attending the National Safety Congress in Chicago had a preview of the most important advance in safety footwear since the invention of the steel toe —*Saftopedics* by Iron Age.

No ordinary safety shoes these, for into their making has gone all the craftsmanship, the design advances, the comfort producing features previously found only in pediformic shoes produced in limited quantities. This construction is an exclusive Iron Age development; unobtainable in any other safety shoe.

Production of *Saftopedics* by Iron Age is being rapidly expanded. Your immediate inquiries are invited. Literature will be sent on request, but better still ask to have our representative give you an eye-opening demonstration. Write today to Iron Age Division, H. Childs & Co., Inc., Pittsburgh 22, Pa.

THE SAFTOPEDIC LAST pictured here is scientifically proportioned to the mold of the foot. It supports the arch and gives balance to the step. There are many built-in construction features to assure long wear and comfort from the first step.

Iron Age SAFETY SHOES

PITTSBURGH 22, PA.

PRODUCTION SCHEDULES CAN SLIP ON SOAP!

Harsh or strongly alkaline soap can help upset the best-laid plans of management by slowing up high-stepping work schedules to a point where it hurts.

Not by bodily tripping up your workers but through the impaired manual efficiency caused by a hand cleanser with an overdose of skin-injuring alkali.

With Lan-O-Kleen this isn't so! Lan-O-Kleen, a powdered soap, contains no harsh ingredients to harm the skin. Wherever soil and dirt dig deepest, Lan-O-Kleen loosens them with gentle thoroughness.

Does it with the sponge-like action of vegetable-meal granules—not by grinding attack on the skin surfaces.

Super-fatted with a generous degree of lanolin, Lan-O-Kleen gives extra protection against the skin drying out—leaving hands with a pliable, ready-to-work feeling.

Make Lan-O-Kleen a safety standby at workers' washstands. Consult one of over 475 West trained representatives throughout the country.

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CLEANSING DISINFECTANTS • INSECTICIDES • KOTEX VENDING MACHINES
PAPER TOWELS • AUTOMATIC DEODORIZING APPLIANCES • LIQUID SOAPS

Jackson's *New* Headrest Goggles

• Light and Easy to Wear • Simple and Easy to Adjust • Practical and Easy to Raise and Lower

LENSES, standard 50 mm. size, are available in shades from 3 through 8. They are held in individual eye cups. Cover glasses protect the filter lenses from pitting.

EYE CUPS are of moulded plastic, joined together flexibly, so they may be easily fitted against the face of the wearer. The outside of each eye cup has ventilating screen, and baffle plate, which prevent fogging, yet keep flying particles and stray light rays from reaching the wearer's eyes.

GOGGLE ASSEMBLY is hinged from the sides of the headrest by telescopic arms. Concealed springs hold goggles gently against the face.

HEADREST distributes the weight over the entire head. It is of light, easy to clean plastic and easily adjusted to any head size. Sweatband adds to the wearer's comfort.

Goggles in protective position. They may be worn over prescription glasses.

To raise goggles, pull forward and up in one operation. Prescription glasses do not interfere.

In "off-guard" position, goggles rest against headrest, are put "on-guard" again in less than a second.

For WELDING, available in two types:

Type W-50, as shown above, with plastic headrest and telescopic arms.

Type WR-50, same goggle assembly furnished with elastic head band.

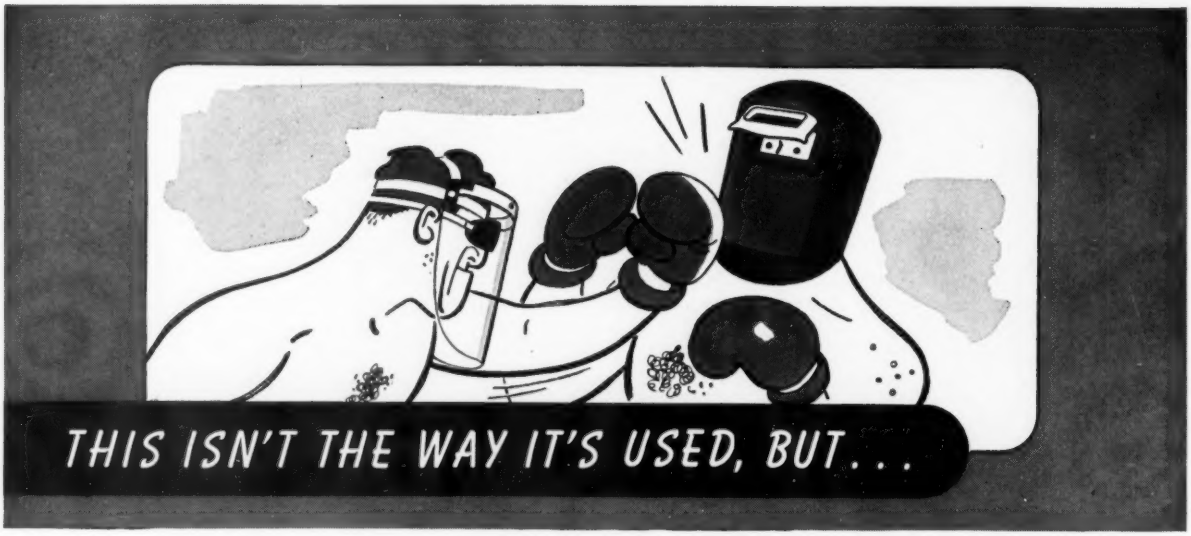
Also available for CHIPPING AND GRINDING:

Type G-50 as shown above, but without baffle plates. Clear, hardened lenses.

Type GR-50, same goggle assembly furnished with elastic head band.

JACKSON PRODUCTS

31739 Mound Road, Warren, Michigan



CESCO EQUIPMENT CAN TAKE IT!

• CESCO safety equipment can take a lot of punishment and come out with remarkable service records. This durability is based primarily on the use of quality materials in CESCO products and the application of quality workmanship in the making of them.

• CESCO equipment is outstanding in durability, safety and comfort—as represented by: **(A) No. 354 Spectacle Goggle, (B) No. 527 Chippers Cup Goggle, (C) No. 749 Face Shield, (D) No. 94 Respirator, (E) Acitex Hood, and (F) No. 401-2 Welding Helmet.** Write today—it will pay you to get full information and prices.

CHICAGO EYE SHIELD COMPANY

2308 Warren Boulevard • Chicago 12, Illinois

CESCO **FOR SAFETY**

Do you have any questions, theories or ideas concerning industrial health or safety? If you want to give them a good airing—send 'em along. We'll publish all space permits.

"Ouch!"

OCCUPATIONAL HAZARDS:

On page 16 of your September issue, reference is made to "Supreme Court of Minn." Correct.

On page 27, reference is made to "Supreme Court of Minneapolis." A second-hand, third grade geography book and five minutes in the corner for the writer, typist or proofreader responsible for this!—C. H. Bigelow, Jr., Treasurer, Farwell, Ozmun, Kirk & Co., Saint Paul, Minn.

And a dunce cap for our lawyer who prepares these articles! And for the editor, who knows better!

"Safer Way"

OCCUPATIONAL HAZARDS:

I have just received the September issue of "Occupational Hazards," through the courtesy of Guardian Safety Equipment Co., and have read through page 16 where I had to stop and write this. I'm the kind of fellow that usually "Let's George" do this sort of thing but I just couldn't pass this one up.

The picture of the gentleman ripping a 2 x 4 is a very good photograph of the proper way to rip a

board, but, what's going to happen if he lets one of the pieces drop down on that unguarded belt? Or what about a fellow employee tripping over that ronduit on the floor or slipping in the excess of saw dust and shavings and sticking his hand in that same belt? It looks like a sheet metal ramp over the conduit, a pulley and belt guard and some shoving on the business end of a push broom are in order.—Harold Hemphill, Safety Engineer, AiResearch Manufacturing Company, Los Angeles, California.

We'll go along in our belief that reader Hemphill is one of the west coast's most efficient (and sharp sighted) safety engineers!

"Laboratory Protection"

OCCUPATIONAL HAZARDS:

In the June, 1947 issue of your magazine, there was an article entitled LABORATORY PROTECTION, which we believe should be of interest to all laboratory technicians. We would like to request your permission to make eight or ten photostatic copies of this article. We wish to provide each of our men working in our chemical laboratories with a copy of this report.—G. B. Reece, Safety Engineer, Southern Counties Gas Company of California, Los Angeles.

We were pleased to send reader Reece tear sheets of the article requested. For those interested in this subject we also recommend the 54-page manual, "Safety Manual for Operation of Copolymer Laboratories," which can be obtained from the Superintendent of Public Documents, U.S. Printing Office, Washington 25, D.C., at 25c.

"Penalize the Worker?"

OCCUPATIONAL HAZARDS:

Your article titled "Penalize the Worker?" appearing in the August issue of Occupational Hazards has created considerable discussion in this office.

It is our firm conviction that the use of disciplinary measures is indicative of a weakness somewhere along the line in management. The responsibility lies primarily with management for the proper instruction of the worker. Therefore, if equipment is not being properly used, it is an indication that the worker was not properly instructed, upon the initiation to the job.

We at Wilson & Co., Inc. have utilized the "J" type program for development of a positive approach to the accident prevention program; based primarily on the outline as

(Continued to Page 38)

There's No

"CURE-ALL" IN CUTTING OIL SANITATION

●

Coolant Formulations and shop conditions vary widely—so do coolant handling problems. To prevent costly coolant spoilage with its foul odors and other disagreeable features, to maintain practical sterility, your Dolge Service Man is prepared to render this service:

1—**He will take samples of your coolant.**

2—**The Dolge Laboratories will examine them bacteriologically and chemically, WITHOUT CHARGE.**

3—**You will receive a complete, confidential report, including the bacterial count.**

Only then, and when found necessary, the *particular* DOLGE STERIDOL GERMICIDE to fit your requirements will be recommended. Employed as directed, the preparation will not irritate the skin or corrode metals . . . and it will prevent spoilage.

The cost? Less than 1 cent per gallon of coolant!

Write for booklet, "Cutting Oil Sanitation"

THE C. B. DOLGE CO.
WESTPORT, CONNECTICUT

STERIDOL
Cutting oil germicides

DEATH TO DISEASE
DOLGE

THE *Finnell* MOTOR-WEIGHTED MACHINE GIVES YOU

A COMPLETE *Automatic Switch Control*

That's because the *Feather-Touch* Safety Switch on the *Finnell* Motor-Weighted Floor-Maintenance Machine operates on *both* sides of the handle. In other words, the switch works with either hand from either side of the handle! The moment the operator releases his grasp, the switch automatically disengages and the machine stops. *Feather-Touch* characterizes the ease with which the switch is held to 'on' position.

This *600 Series Finnell* is self-propelled . . . glides over the floor with virtually the effortless guidance of the operator. Horizontally-mounted motor and correct distribution of weight, affording truly balanced operation, also contribute to the greater handling ease of the *Finnell* Motor-Weighted Machine. Mounts a G.E. Drip-Proof Capacitor Motor . . . is equipped with Timken Bearings. And the ruggedly constructed worm drive, housed in an extra-capacity leak-proof gear case that is lubricated for 2500 hours, assures smooth, noiseless performance. Rubber handle grips are perfectly insulated. A precision product throughout, reflecting *Finnell's* four decades of specialized experience in the manufacture of floor-maintenance equipment.

The *600 Series Finnell* is adaptable to scrubbing, waxing, polishing, steel-wooling, sanding, and grinding. Four sizes from which to choose: 11, 15, 18, and 21-in. brush diameter.

For consultation or literature, phone or write nearest FINNELL branch or Finnell System, Inc., 3512 East Street, Elkhart, Ind. Canadian Office: Ottawa, Ont.

FINNELL SYSTEM, INC.

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FLOOR-MAINTENANCE EQUIPMENT AND SUPPLIES

BRANCHES IN ALL PRINCIPAL CITIES

Occupational HAZARDS

VOLUME 10 • No. 2

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COVER: This month's cover picture looks like the start of a perfect Christmas day, but don't let your eyes fool you! The "snow" is really foam which can extinguish an oil fire in a hurry.

"THERE'S PROFIT IN PREVENTION"

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for New protection against Old hazards ... get WILLSON

Style No. X41

GLOVE-FIT PROTECTION AGAINST SPLASH ... This Over-All* rubber goggle with snug fitting resilient rolled edge takes the danger out of splash and spatter; provides wearing comfort over spectacles.

Style No. 731

ONE-PIECE CAP CARTRIDGE ... New chemical cartridge respirator with four interchangeable cap cartridge filters protects against low concentrations of specific vapors and gases. U. S. Bureau of Mines Approved.

Style No. 750D

SETTLE THE DUST PROBLEM ... Newly approved by Bureau of Mines for all dusts. Easier breathing over long periods provided by extra large dual throw-away filters.

*Reg. U. S. Pat. Off.

For complete information on these products and their application, as well as many more eye and respiratory protective devices, get in touch with your nearest Willson distributor or write us direct.

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Established 1870

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12 Reasons Why

HY-TEST Safety Shoes

ARE FIRST CHOICE OF AMERICA'S LEADING SAFETY DIRECTORS

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2 SAFE EZE BACK ONE PIECE QUARTER NO RIPPING OR BINDING
3 ONE PIECE SOLE LEATHER COUNTERS LEATHER COUNTER POCKETS
4 STEEL SHANK FOR GREATER SUPPORT AT ARCH
5 7-IRON FULL-GEMMED OAK LEATHER INSOLE
6 SOLES OF THE FINEST QUALITY MATERIALS
7 AUSTEMPERED ANCHOR FLANGE STEEL BOX TOE
8 REGULAR SHOE LAST
9 TOUGH BOX TOE LINER PROTECTS VAMP LINING
10 SHOCK ABSORBING FELT DOUBLER
11 SLANT-EZE TOP FOR LACING COMFORT

12

FULL RANGE OF SIZES, TYPES AND STYLES FOR EVERY SAFETY NEED

...Insure Workers Feet In Sure Protection

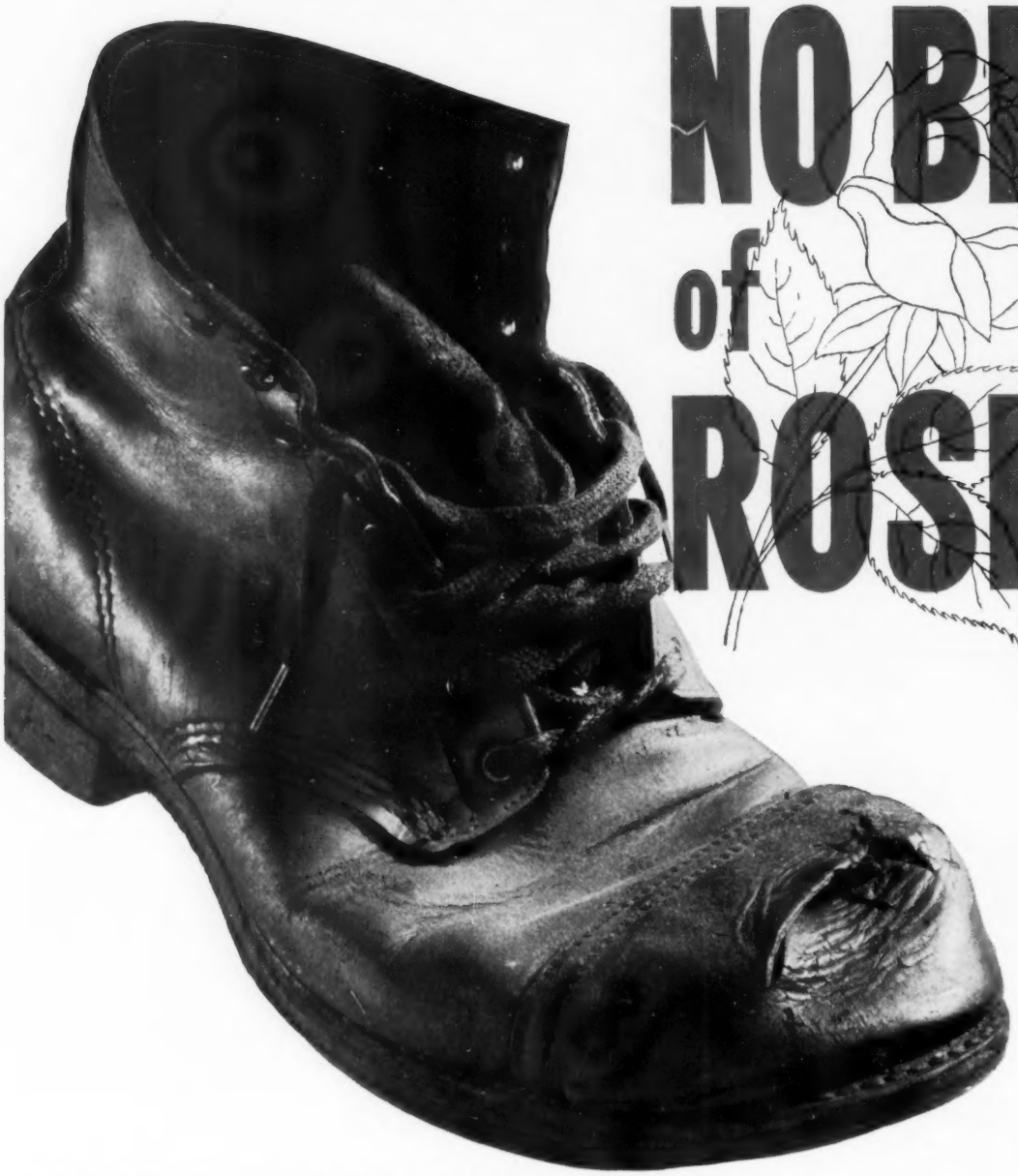
50 DIFFERENT TYPES
9 DIFFERENT KINDS OF SOLES
WIDTHS AA-EEE, SIZES 5-15
5 LASTS (Dress & Work)
WELT AND NAILED CONSTRUCTION

HY-TEST Safety Shoes

HY-TEST SAFETY SHOES

HY-TEST DIVISION • INTERNATIONAL SHOE COMPANY • ST. LOUIS 3, MISSOURI • EASTERN OFFICE • MANCHESTER, N. H.

NO BED of ROSES



A LIFT CHAIN SLIPPED. 600 pounds of steel bedplate crashed down on this Lehigh safety shoe like a power-driven sledge. The 1800-pound impact actually imbedded a corner of the bedplate in the Lockrim* steel toe box. The workman in this Lehigh had only two bruised toes! Four days layoff. No great news. Safety shoes are supposed to save toes. But no safety shoe was ever built to take punishment like this. Lehighs do and deliver. Feet and toes come high. Lehighs don't. Phone or write us today and we will have a representative call.

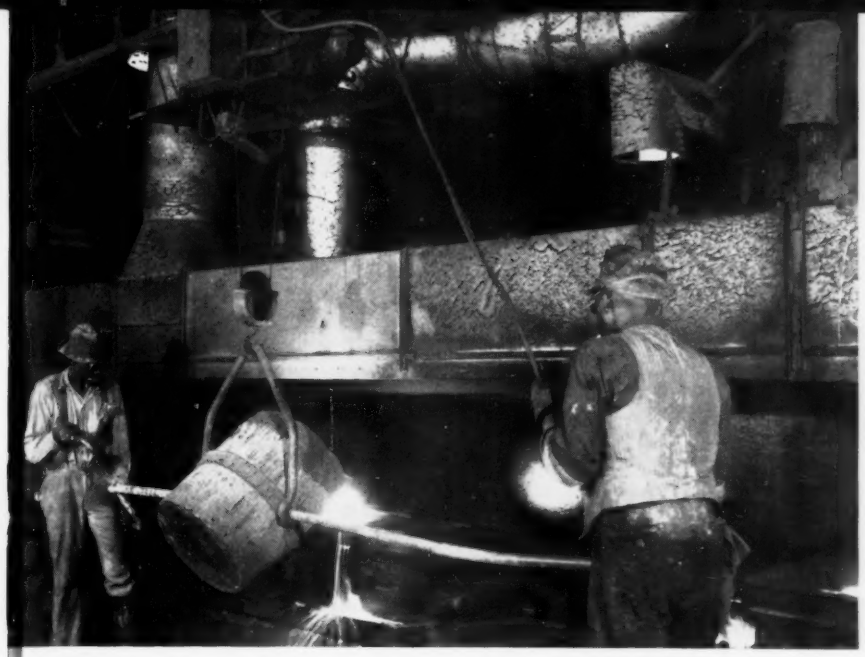
FREE Pay envelope enclosure with ten similar case histories will convince any skeptic that safety shoes pay. No advertising. Send for copy or enough to cover your payroll.

*T. M. REG.

LEHIGH Division of the ENDICOTT JOHNSON CORPORATION

SAFETY SHOE COMPANY

WESTERN OFFICE: 12th AND SPRUCE, ST. LOUIS 2 MO.



These hood ventilators are part of an extensive system installed at Ferro Machine and Foundry, Inc., designed to remove smoke and toxic fume hazards.

X-RAY ANALYSIS OF SILICA DUST IN FOUNDRIES

This article brings to readers of Occupational Hazards magazine the results obtained by the first extensive work reported on X-Ray analyses of airborne samples of foundry dust. It proves the effectiveness of engineered installations of exhaust ventilating equipment.

BY DeWITT HUFFMAN
Safety Advisor, The Industrial Commission of Ohio Division of Safety and Hygiene, Columbus, Ohio

IN THE evaluation of an occupational health hazard from the inhalation of foundry dust, it is necessary to know two basic things, viz. the number of dust particles in the air and the per cent of free silica in the dust. Techinicians of the Ohio Division of Safety and Hygiene have made numerous dust counts, using the standard light field method as developed by the Bureau of Mines, and have made a number of petrographic analyses of settled dust samples. This work has also been done by a number of other investigators using both air-borne and settled dust samples. However, no extensive work has been reported on X-ray diffraction analyses of air-borne samples of foundry dust.

Realizing that they had only part of the story from dust counts, the Ferro Machine and Foundry, Inc., Cleveland *(see article, "Clean Air and Education", July, 1947 Occupational Hazards magazine—Ed.)* engaged the services of the Pittsburgh Testing laboratory to make X-ray diffraction analyses of dust created in various foundry operations. The Ferro Machine and Foundry Company is engaged in the manufacture of gray iron castings for the automotive industry. The castings consist largely of automobile motor blocks and heads.

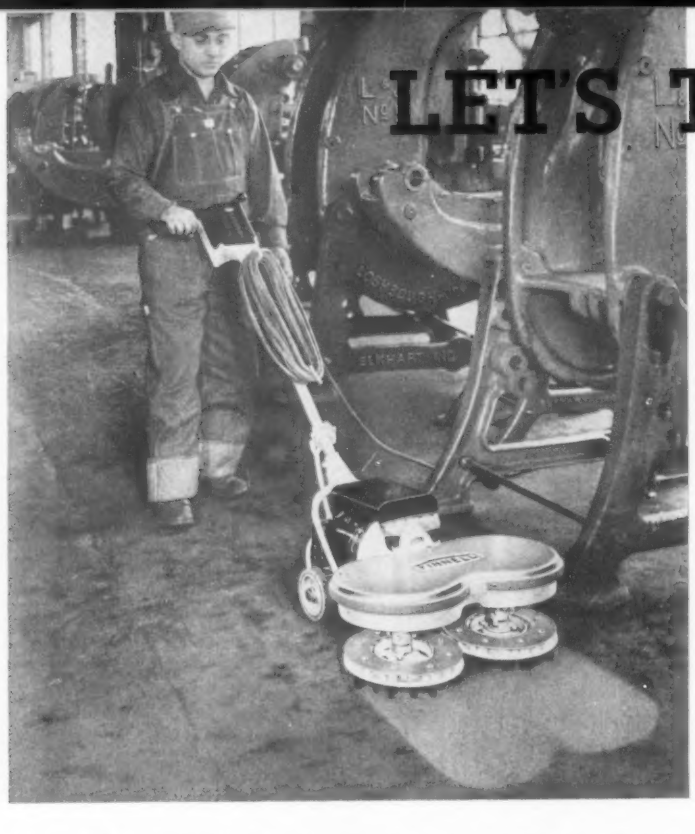
DeWitt Huffman graduated from Ohio State University in 1930 with the degree of Bachelor of Chemical Engineering. He has worked for the Ohio Division of Safety and Hygiene on industrial health problems since 1940 with the exception of two years when he served as an officer with the Army Industrial Hygiene Laboratory and made industrial health surveys of army industrial installations throughout the country.

For obtaining air-borne samples of dust a salicylic acid filter devised by the Industrial Hygiene Foundation, Pittsburgh, Pa., was used.

The filter consisted of double screens between which a layer of salicyclic acid approximately ⅛" thick was placed. The double screens

(Continued to Page 38)

LET'S TALK ABOUT FL



Time and labor savers, many floor maintenance machines are adaptable to scrubbing, waxing, polishing, steel-wooling, sanding and grinding operations. (Photo: Finnell System, Inc.)

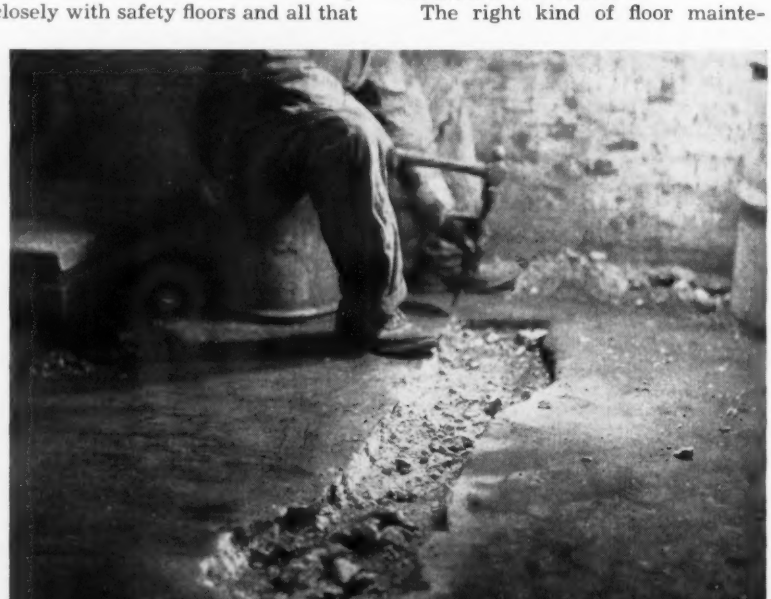
Faulty floor maintenance is costing management enormous sums of money each year under the guise of so-called "hidden costs." High insurance rates—loss of manpower from slips and falls—high indemnity costs—lowered employee efficiency —increased cost of faulty maintenance methods and direct damage to floors are only some of the ways in which management pays for unsafe and incorrect methods of floor maintenance.

LAST MONTH'S feature article, "Let's Talk About Safety Floors!" pointed out to the readers of OCCUPATIONAL HAZARDS magazine that large sums of money are being paid out by management each year because of slips and falls due to slippery and otherwse foot-hazardous floor surfaces. 150,000 workers are injured by slipping and falling while on duty during the course of the average year. Falls during 1945 represented 24.9% of the total compensation paid out in the state of Illinois and the average cost per case was $228.

This month, OCCUPATIONAL HAZARDS is bringing up the subject of *floor maintenance* because this subject is one that ties in very closely with safety floors and all that this term implies.

Accident Prevention

The right kind of floor mainte-



Expert advise can be obtained from reputable manufacturers of floor maintenance materials for special repair problems. A job done right the first time is a saving in money and time. *(Photo: Master Bldrs.)*

JFLOOR MAINTENANCE

nance plays an important role in the prevention of slipping and falling accidents. Many types of floors that are not primarily designed as "safety floors" can be given many of the characteristics of bona fide safety floors by good maintenance methods. Such methods can make these floors non-slippery, or can preserve ordinary type floors through many years so that they do not pit, crumble, splinter, or otherwise became hazardous to foot-safety because of the deterioration which comes from the wrong kind of floor maintenance.

Hidden Costs

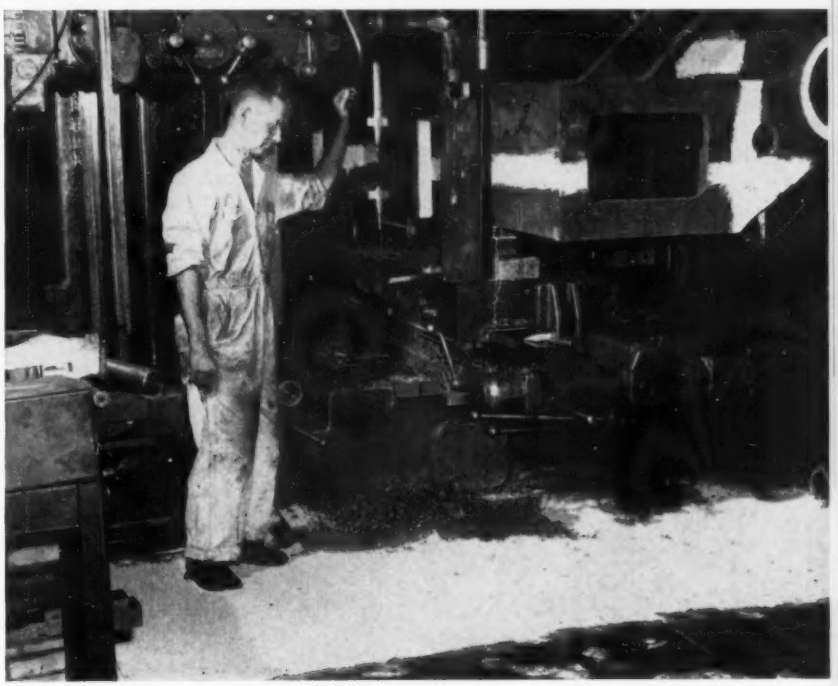
It is important to realize while considering floor maintenance, that compensation from slips and falls are only a small portion of the bill which management pays each year for faulty floor maintenance methods. The bulk of the bill consists of items usually referred to as "hidden costs". An examination of these "hidden costs" will soon bring them out into the open.

Liability insurance rates are based on individual plant accident reports. Consequently, the high accident frequency rate resulting from slip-shod floor maintenance result proportionately in increased insurance rates. These hazardous floor conditions which are inherent with the wrong kind of floor maintenance are directly reflected in employee slow-down while on the job. Their efficiency is lowered, as well as their morale.

Experience indicates repeatedly that the wrong kind of floor maintenance is more costly than the right kind. Materials and labor for the wrong kind of maintenance often run 50% more than if the job were being done right. This does not include any of the cost to management other than materials and labor.

Damage to Floors

The largest portion of the bill which management pays each year for faulty floor maintenance *(whether they realize they are paying such a bill or not!)* probably is the direct damage done to floors. "More floors are *washed* away than *worn* away." The wrong kind of maintenance causes more damage to floors than



Oil absorbant around this cutting machine removes dangerous oil accumulation, reduces the hazard of destructive fires and costly falling accidents.
(Photo: Oil-Dri Corp.)

Industrial vacuum cleaner used to clean up water from floor. A single operator and machine does better work in less time than several hand moppers.
(Photo: B. F. Sturtevant Co.)

does the heaviest traffic. In any discussion of this kind, the maintenance and cleaning of floors is best expressed in the well-known slogan of the paint industry: *"Save the surface and you save all."*

Flooring manufacturers and specialists in the field spend thousands of dollars and considerable effort to produce floor surfaces which present pleasing appearances; which are non-slip, yet sufficiently tough and resilient to withstand heavy usage. This top surface can be spoiled by incorrect maintenance methods and the use of poor soaps, detergents and other cleaning and maintenance equipment.

Once this top surface is spoiled, the floor quickly becomes pitted and hazardous to foot safety. In addition to presenting a deplorable appearance, such flooring greatly increases cleaning and maintenance costs. It is axiomatic that pitted or rough surfaces, besides being extremely hazardous, require more labor than smooth, unmarred surfaces.

NAPOLEON and UNCLE ELBY
FLOORED AGAIN!
THEY FORGOT TO USE OIL-DRI -- IT MAKES FLOORS SKIDPROOF!
REDUCE FIRE HAZARDS, PREVENT COSTLY FALLS ON OILY DRIVEWAYS, FACTORY FLOORS, AISLES AND STEPS

Use

Oil-Dri Reg. U.S. Pat. Off.

ABSORBS ALL TYPES OF OILS, GREASES AND FATS

Oil-Dri Reg. U.S. Pat. Off. **ALL-PURPOSE**

ABSORBS ALL TYPES OF OILS, GREASES AND FATS, PLUS WATER AND SOLUBLE OIL SOLUTIONS

IN EVERY state in the Union OIL-DRI and OIL-DRI-(All-Purpose) are used regularly by factories, breweries, food plants, repair shops, service stations and power plants to remove dangerous oil and grease accumulations and oil-and-water "slicks" from floors around equipment, on steps and in aisles. Their use greatly reduces the hazard of destructive fires and costly falling accidents.

Write TODAY — Our representative will make a free demonstration on your floors.

Oil-Dri Corporation OF AMERICA
520 N. MICHIGAN AVE. CHICAGO 11, ILLINOIS
Member of National Safety Council

Importance of Experienced Help

There is always the best way of doing a maintenance job. Various conditions call for different methods, and the way of finding that "one best way" often requires long, tedious methods, *if the job is attempted alone by individuals in the plant.* There is no such thing as a "standard" procedure which can be successfully applied to all floor maintenance problems.

The maintenance of floors under abnormal conditions, such as factory floors on which heavy deposits of oil, grease, chemicals, acids, dusts, etc., are found requires individual analysis before the proper work method can be found. A cleaning crew foreman or group leader seldom has experience to cope with such situations. It usually proves costly to management to allow the foreman to "solve" such maintenance problems by himself. It is to management's benefit (and profit) to call in expert help from the outside. *There are several reputable manufacturers of various floor maintenance materials and products who can be depended upon to give expert advice based on their previous experiences and up-to-date knowledge of the subject.* In most instances, it is good business for management when planning a practical and effective floor maintenance program to call for the personal services of trained and experienced floor maintenance experts. There are many differences in floors and many differences in traffic conditions that will determine the maintenance program. An expert can make a complete analysis of your floor maintenance program after taking these many factors into consideration.

Basic Maintenance Principles

For the maintenance of floor surfaces which are new or in reasonably good condition and not subject to the abnormal conditions mentioned earlier, there are a few basic principles which are applicable to all familiar types of floors.

It is a common mistake among maintenance crews to use excessive amounts of soap which they hope will save them much work. The contrary is true. Extra soap in a washing solution will leave a film of oil on the floor. To remove the extra soap, or in this case, oil film, the crew members will have to use more labor in rinsing. If the rinse is poor and the oil film remains on the floor it will collect dirt and the next cleaning will require more work. If soap

(Continued to Page 30)

CHECKING Carbon Tetrachloride HAZARDS

Carbon tetrachloride is a clear, colorless liquid with a characteristic aromatic odor. Although relatively safe when under efficient engineering control, the inhalation of concentrated vapors may cause serious or even fatal poisoning. It is toxic by inhalation of vapor and prolonged or repeated contact of the liquid with the skin or mucous membranes.

- ✓ safe handling procedure
- ✓ personal protective equipment
- ✓ engineering controls
- ✓ mechanical ventilation

THE VAPOR of carbon tetrachloride is over five times as heavy as air which causes it to settle, tending to increase concentrations in the breathing zone and especially at floor level, in pits and in enclosed rooms. Air tests for the vapor, released in manufacturing processes, show continual variations in parts per million of workroom air. Because of this, every effort should be made by plant engineers to hold such exposures to a safe operating mean. The American Standards Association sets 100 p. p. m. as the limit. To hold peak fluctuations below this level, an operating mean of 50 p. p. m. is recommended.

Dangerous vapors may accumulate in depressions, under platforms, and in dead spaces. The toxic symptoms of absorption, regardless of the mode of entry into the body are: Headache, mental confusion, depression, fatigue, loss of appetite, nausea, vomiting, loss of coordination, and sense of balance and visual disturbances. There may be local irritation of eyes, skin, and respiratory tract. Onset of signs and symptoms may be delayed two to eight days after severe exposure.

It is essential for safety that equipment be used and maintained as recommended by the manufacturers. Enclosed, or partially enclosed processes prevent the escape of vapor into the workroom atmosphere. They are recommended wherever possible. Proper operation and maintenance of piping and equipment, and adequate periodic inspection for leaks, should be provided. All open carbon tetrachloride operations require adequate mechanical exhaust ventilation.

✓Ventilation

Since carbon tetrachloride is 5.32 times heavier than air, general workroom ventilation in no way takes the place of special mechanical ventilation of the down-draft type. Intakes to the exhaust ventilating system should be at, or under, the source of the vapor; designed to draw the vapor away from—*but not past*—the faces of the operators.

A slot-type lateral intake is recommended for preventing escape of vapor from open tanks. A grid-type intake into the floor or bench is recommended for handling vapor from the spraying of large parts.

✓Engineering Controls

Processes should not be located near open flames or high-temperature operations, since carbon tetrachloride decomposes at high temperatures, to form corrosive and otherwise undesirable products. (It is for this reason that persons using carbon tetrachloride fire extinguishers are advised to avoid breathing fumes of the extinguisher fluid. Upon contact with open flame, CCl_4 decomposes to give of hydrochloric acid and other products.)

Processes should be designed so that the operator is not exposed to direct contact with carbon tetrachloride or its vapor. The technical problems of designing equipment, providing adequate ventilation, and formulating operational procedure which promise maximum security and economy, can be handled best by specialists in this field and by safety experts. *The manufacturers of carbon tetrachloride, and of the equipment in which it is to be used, are always prepared to help with these problems and to assist in maintaining safe working conditions.* In most states, authoritative advice and assistance may also be obtained from the Industrial Hygiene Division of the State Health Department, or from the Labor Department.

✓Handling Precautions

Drums containing carbon tetrachloride should be unloaded carefully to prevent damage. Each shipment should be examined for leaking drums and if any are found, they should be handled with particu-

(Continued to Page 35)

INDUSTRIAL *Accidents in the News . . .*

These accidents are taken from the pages of the Nations Newspapers. They've all happened—they didn't have to!

Kansas City, Mo.

L. A. Beretta, son of Mr. and Mrs. Ceno Beretta, is improving from burns on the hand and face received when some naphtha he was handling caught fire at the cleaning shop on Franklin avenue Sunday. His burns, while painful, were said not to be serious. The naphtha he was handling caught fire from a spark caused by friction of a metal can on concrete.

Prevention:

Non-spark flooring, or non-spark floor coating should be used in cleaning shops or in any other industrial operation where there is danger of explosion due to the presence of volatile dusts or vapors which can be ignited by a chance spark. Such non-spark coating can be easily applied over any existing floor surfaces.

◆

Holyoke, Mass., Transcript & Tele.

Henry Schott of Springfield, is in in a Springfield hospital with a possible compound fracture of the right leg following an explosion today in the Package Machinery Company's new plant in East Longmeadow. According to police, Schott was engaged in cutting a metal barrel with an acetylene torch when the explosion occurred.

Prevention:

Welding or cutting empty tanks, barrels or other metal containers should never be started until all traces of flammable gases or vapors have been eliminated. Many unmarked containers have been used for storage of such gases, so it is best never to take chances. Purge by steam or some other acceptable method before attempting any cutting operation.

◆

Martinsburg, W. Va., Journal

Mrs. Gladys Fink, 21, of Stephens City, Va., an employee of the O'Sullivan Rubber Company, was *scalped* Thursday afternoon, when, for some reason not known, she reached underneath the trimming table and her hair caught in the drive shaft of the trimming machine, according to John Tuttle, director of employee relations. The scalp was mangled so badly it had to be cut up to be extricated from the machinery. At Memorial Hospital, Winchester, attendants said Mrs. Fink was in fair condition and was not suffering.

Prevention:

Headdress for women industrial workers are designed to reduce to a minimum the danger of hair entanglement in moving machinery. To avoid such tragic accidents as that described above, all women should be urged to wear such protection.

◆

Long Island City, N. Y., Star & Journal

Angelo Marrero, 35, of Manhattan, and John Bilbo, 44, of Brooklyn, were caught in the "explosion" of a 70-foot-long, high-pressure brick kiln at the National Brick Company Yards. The two men were standing in front of the great two-ton circular door to the oven when it suddenly gave way with a great rush of steam and a crash. The accident was said to have occurred when the two men unlocked the securing clasps of the door. About 30 pounds of pressure blew the door back on its hinges, knocking the men aside. Marrero was rushed to St. John's Hospital in critical condition with body and face burns, a fractured skull and lacerations of the face and head. Bilbo was reported to be in good condition, suffering only from first-degree burns on the face.

Prevention:

According to all reports, this accident was the direct result of carelessness on the part of the men involved in the accident. A steam guage on top of the oven indicates the steam pressure within. The workmen are supposed to wait until the guage reads 15 pounds (normal atmospheric pressure) before opening the doors. The men in this case unlocked the clasps of the door before the steam pressure had been lowered to the required 15 pounds.

◆

Martinsburg, W. Va., Journal

Shirley Southard, Shenandoah Junction, who is employed by the Baltimore and Ohio Railroad Company, was painfully injured the latter part of last week at his work, when a piece of steel broke from a hammer and penetrated his shoulder. It was necessary to take Southard to the Charles Town General Hospital for treatment.

Prevention:

Flying metal from inferior tools may cause severe injury and even death. Hand tools should be made of carefully selected metal that is hard enough not to mushroom or flatten when struck, yet of sufficient softness not to chip. Tools with splayed, mushroomed, split or cracked surfaces should be immediately discarded. It is dangerous practice to "fix" old tools so that they can be used "a while longer" on the job. This can easily lead to dangerous accidents.

ELEVATOR HAZARD SIGNS

CAUTION
GATE MUST BE DOWN WHEN ELEVATOR IS UP
SAFETY FIRST
DONT RIDE ON THIS ELEVATOR IT IS FOR FREIGHT ONLY
CAUTION
BE SURE ELEVATOR IS LOCKED WHEN LOADING AND UNLOADING
NOTICE
THIS GATE MUST BE CLOSED BEFORE THE ELEVATOR CAN BE OPERATED
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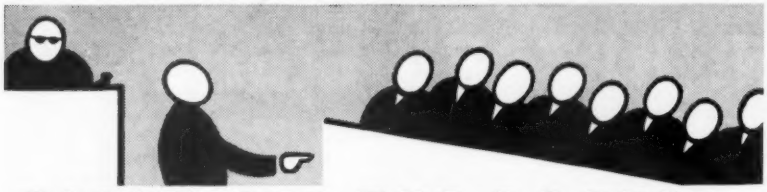


RIGHT OFF THE DOCKET

The trend of litigation on workmen's health and accident compensation is reflected in these briefs on the latest and most representative cases coming to trial in the intervals between issues. Familiarity with this trend is important to every industrialist. Clip cases and file for future reference.

Injury Aggravates Previous Disease

Roscoe Holly died of uremic poisoning of Bright's disease. Claim was made by his son who sought compensation on the ground that although the primary cause of his father's death was a pre-existing disease, yet this disease was agravated and accelerated by an accidental fall arising out of and in the course of his employment.

Company contended that the accidental injury to the employee did not arise out of his employment. Secondly, that there is no basis in the record for the finding of a casual connections between the accidental injury and the subsequent death of the employee.

Holly, 54 years of age, was working as a mechanic for approximately three years prior to his death. His duties required him to repair and oil the motors in the mill, one of which

was located near the ceiling on the second floor of the building. This particular motor was reached by ascending a ladder to the height of five or six feet, and then walking on a plank called a "cat walk" which extended over an open bin about eight feet deep.

On April 17, 1945, at approximately 7:30 a. m., he checked in for work and proceeded to oil the motor in question. While engaged in this work and when walking over the cat walk to reach the motor, he fell in the bin beneath him. Upon being removed from the bin, he complained that he was sick. Whereupon he was sent to the company's doctor, who assisted him to an automobile of one of his co-employees who went with him to the doctor's office.

Doctor found a bruise or the indication of an injury to the right hip. The skin was cut off a place about the size of a fifty cent piece. The X-ray did not show any fracture, but did show a large stag horn calculus in right kidney. The right kidney was badly shocked by the fall.

Holly went to bed and grew progressively worse, died shortly after. The autopsy report showed not only a large stone in the right kidney, but also a stone in the left kidney, or in the tube leading to the bladder which partially blocked passage.

Cause of death was uremic poisoning. Physicians expressed surprise that one so diseased could have lived as long as he did. All of the doctors admitted that the fall could have contributed to the sudden onset or aggravation of the disease.

Court concluded that the record indicated that Holly was a man who prior to his accidental fall, appeared to be perfectly healthy, with a hearty appetite, who had never lost any time from his work in over three years; nor had he complained of any illness. Nor had he ever consulted a doctor for any cause. He suffered a fall and from that time on was incapacitated, grew progressively worse and died.

In view of the circumstances, and of the medical testimony, they could reasonably arrive at no other conclusion then that the Bright's disease was aggravated and accelerated by the accidental injury.

Where a previously diseased condition is aggravated by injury or accident arising out of or in the course of employment, and results in death or disability, there is a compensable injury.

Holly vs. Spartan Grain and Mill Company, et al,
Supreme Ct. of Ark., April 3, 1947
42 Southern Reporter, Page 59

Hit By Stray Bullet On Company Premises

NOWICKI was employed as a scraper operator by Byrne, who was a contractor doing certain work for the Federal Government at the Hillsgrove airport near Providence.

The accident took place on the afternoon of Sunday, September 5, 1943. Claimant on that day had reported to work at 7:00 A. M. and worked until 3:30 P. M. Construction work was then stopped for reasons connected with the nature of the job and number of hours consumed, and all the men including the claimant were laid off for the day.

Nowicki did not leave the airport at once, but talked with Byrne's master mechanic and his son, who were making some repairs to a tractor. Nowicki eventually assisted them with these repairs. There appears to be some conflict on the point as to whether or not he volunteered to help with this work or was ordered to do so by the master mechanic.

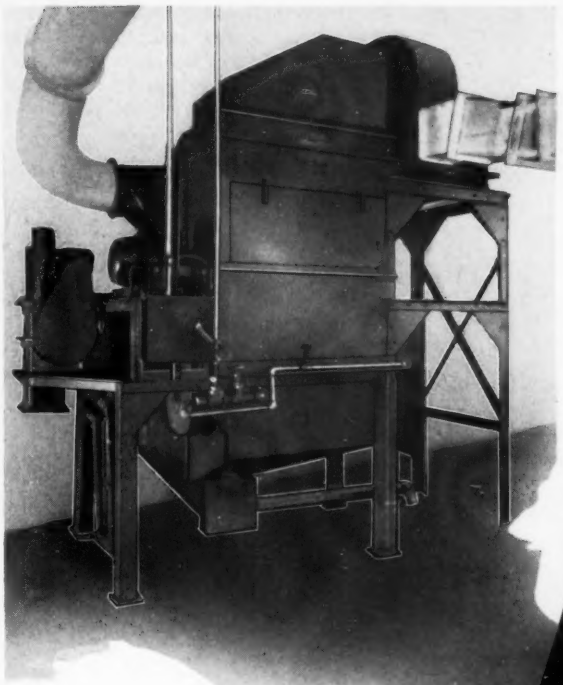
About 5:00 P. M. the repairs were completed and Nowicki entered his

own automobile, which was parked near by, and started to drive it out of the airport grounds to the public highway, which was about a mile away, the grounds being closed and there being guards at the main gate. The claimant was driving toward this gate, the exact distance which he had covered being in dispute, when he was struck in his left arm between the elbow and the shoulder by a stray rifle bullet fired by a youth who was engaged in target practice in the rear of his home which was outside the airport area.

Payment under the Compensation Act is resisted on the theory that the accident did not arise out of or in the course of his employment. After applying the established law, an award was denied on the grounds that the injury in question did not result of any risk arising out of claimant's employment in the airport or from any risk reasonably incident to such employment or the conditions under which it was required to be performed.

The injury here was not a natural or necessary consequence or incident of the claimant's employment or of the conditions under which it was carried on. There appears no casual

(Continued to Page 24)



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Visitors at the Hamilton Foundry & Machine Co. were impressed by the company's numerous activities relative to the promotion of safety and health among its employees.

ACCENT ON SAFETY DURING PLANT OPEN HOUSE

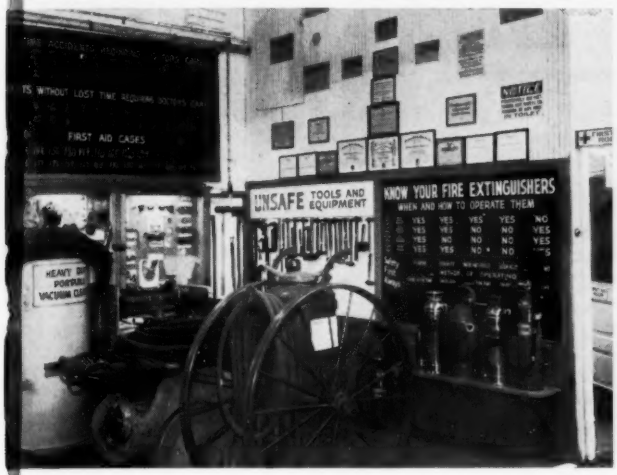
"Open House" events deserve special consideration, not alone because of their educational value but also because they bring together more closely the people of the community in an understanding of the problems of the local industry. Good will is fostered between the employer, the employee and the employee's family. Production without good will is impossible.

Employees, their families, community leaders and the general public of Hamilton, Ohio, were guests of The Hamilton Foundry & Machine Co. during a recent two-day Open House celebration. Nearly 6,000 men, women and children, including 500 out-of-town guests, visited the plant to see a grey iron foundry in operation. The tours, complete with special guides in each area, were routed through all departments of the plant, including the laboratory where the breaking of iron bars in the 30-ton testing machine was conducted.

Prominent among the displays viewed by the visitors were the many safety, health and fire prevention displays. It is well know that The Hamilton Foundry & Machine Co. is quite proud of its safety and hygiene record. Many fine comments from the Open House visitors were received concerning the clean foundry and the way in which the company constantly stresses safety and provides for the safety and health of their employees.

First aid fire appliances designed to combat any type of fire are conveniently situated throughout the foundry. Notice safety ladders in background.

Hamilton Foundry's permanent safety display is located between main plant entrance and time clock. Note score board indicating current lost-time accident records. Best record so far: 225 days without a lost-time accident! Cleaning equipment in foreground.



This display consists of safety equipment given free to employees whose jobs require them by The Hamilton Foundry & Machine Co. This policy has done much to promote safety among the employees.

Hamilton Fire Chief, Robert Harmon, congratulates Personnel and Safety Director, Eldon M. Altman, on winning second place award in national safety contest.

Mr. Charles Barth, representative of the Ohio Industrial Commission, stands behind his display table. He is an integral part of the safety program.

Pictured here is the display designed to show employee benefits available at The Hamilton Foundry & Machine Co. Hospital care, doctor's plan, and group insurance is included. Such evidence of management's interest in employee health is a valuable contribution to the family's sense of security.

A glimpse into the clean, orderly First Aid Room where injured employees receive prompt, efficient service. Temporary medical display was put in hallway for convenience of the visitors.

MEN AND MATTERS

News • Activities • Plans

ATOMIC SAFETY BOARD APPOINTMENT . . . Robert H. Albisser, Safety Director of Merck & Co., Inc., manufacturing chemists, has been appointed to a special advisory board of the Atomic Energy Commission. Albisser is one of ten members of a special board formed for the critical review of the Atomic Energy Commission's health, accident, and fire protection activities. The group, made up of specialists in the safety field, will survey the plants and laboratories of the Atomic Energy Commission.

In addition to directing the Merck safety programs, Albisser is chairman of the New Jersey Chapter, American Society of Safety Engineers and past chairman of the Industrial Safety Division, Eastern Union County Chamber of Commerce. Active in state and national safety programs for many years, he is also on the General Safety Committee, Manufacturing Chemists' Association, and the Executive Committee, Chemical Section, National Safety Council.

FLEET SAFETY CONTEST . . . Northrop Aircraft, Inc., fleet driver drove 636,722 miles through traffic-packed Los Angeles streets to win sweepstakes honors in the 1946-47

fleet safety contest sponsored by the Greater Los Angeles chapter of the National Safety Council. Here B. G. Reed, Northrop vice president and assistant general manager in charge of production, receives congratulations from Bill Goodwin and Peggy Knudsen, safety-minded radio comedians. Reed, in accepting the awards, declared credit for the firm's safety achievement should go to the teamwork of the Northrop transportation and maintenance departments. Presentation of the awards marked the second time Northrop had won the aircraft manufacturing division contest.

NEW APPOINTMENT AT KIDDE . . . Walter Kidde & Company, Inc., of Belleville, New Jersey, announce the appointment of Mr. Stuart Grant as Advertising Manager.

Mr. Grant was previously with The

Mr. Grant

Pure Oil Company and served as a Lieutenant Colonel during the war. In addition to his advertising duties, he will aid in sales promotion activities.

PULLMAN SAFETY AWARD . . . Safety trophy won by the Michigan City, Inc., plant of Pullman-Standard Car Manufacturing Company during a 1946 competition between all railroad shops of the company is shown in this picture. Flanking the shining trophy, left to right, are: Paul J. Brand, company safety director; A. A. Logmann, Michigan City manager of works; Henry A. Kint-

zele, and George Kieffer, employee representatives, and Henry Brand, Michigan City Safety Supervisor.

SAFETY CONGRESS . . . It has been two months since the National Safety Congress and Exposition was held in Chicago, but we are so impressed, and receive so many comments regarding the smooth, seemingly effortless manner in which the Exposition was run, that we want to take this opportunity to congratulate all those who were responsible for arranging the many details that resulted in the most successful congress in the history of the National Safety Council. Deserving special praise is Mrs. C. H. Miller, bureau

Mrs. Miller

director, advertising bureau of the Council, who was in charge of the Exposition which featured nearly 100 industrial and public safety displays.

Associated Drug Industries emphasize . . .

SAFE HANDLING of Sodium Fluoride with

1. PERSONAL SAFETY EQUIPMENT

2. ADEQUATE DUST REMOVAL SYSTEMS

BY HERBERT W. HOYT
President
Associated Drug Industries, Inc.

This article by the president of a company handling dangerous chemicals indicates that top management considers safe industrial practices important. They recognize that modern safety equipment reduces health and safety hazards to a minimum. Such practices are profitable—both to management and to employees!

THERE are a number of chemical poisons used in industry for which there are no positive antidotes should they accidentally be taken internally. In this general classification is sodium fluoride which is a common component of insect poisons and so active that in its aqueous solution it is used for etching glass.

Sodium fluoride is now being used as a flux in steel making. The very presence in the air of so active a poison is a menace to workers—so much so that the charging crews on steel furnaces have refused, through their unions, to handle it in bulk. The chemical is now packed in tubes by our company; a tube which is thrown without opening into the steel charge.

Packaging

A method of handling had to be devised which would insure maximum protection for workers on packaging machines which we use to put the chemical in small aluminum tubes.

This fluoride has a specific gravity of only 2.8 in the commercial preparation and is as light as the finest cake flour. It does not have to be taken internally to kill. In contact with the skin it causes painful dermatitis. When breathed over an extended period of time it destroys membranes and bone tissues and ultimately is fatal.

Protective Equipment

An obvious precaution in the filling of packaging machine hoppers was the use of respirators and rubber gloves by all workmen handling the fluoride in its bulk containers. But even more precaution was needed for machine operators who were exposed to such free sodium fluoride dust as would escape from the machine hoppers during the filling process.

Dust Removal System

The hazard of this free sodium fluoride dust is being overcome at Associated Drug's Atlas Laboratory division at Akron, O., by installation of an air suction system which consists, in part, of an induction pipe immediately over the line of packaging machines. This safety measure long has been used in industries where it was necessary to remove noxious gasses. In the case of sodium fluoride, however, it was not only necessary to remove the dust from vicinity of the worker, but to keep any from escaping into the air outside the plant.

To this end the air system was designed with a wet filter at its outlet, a moist trap which catches the deadly particles but does not interfere with efficiency of the pressure fans.

Safety Shields

As a final precautionary measure there is being designed a plastic shield for packaging machine tube-cup assemblies so that machine operators can insert empty tubes into the tube cups through small "windows." Because there is little or no agitation of the powder after it is ejected into the tubes and sealed, this precaution could reasonably be supposed as unnecessary. But when working with hazards that menace the life and health of employees there is no precaution that can be termed "unnecessary." They are all important.

(From Page 18)

connection between the injury to Nowicki's arm from the shot fired and the claimant's employment at the airport or the conditions under which he was called upon to do his work there.

Claim disallowed.

Nowicki vs. Byrne, et al
Supreme Ct. of R. I., June 27, 1947.
54 Atlantic Reporter, 2nd series, Page 7.

Claim Death Due To Chill

THE employee's widow, Annie Phillips, asserts that her husband's death was a result of an accident occurring on November 1st, 1935, in which he suffered a spiral fracture of the right humerus. An open agreement between the employee and the employer was approved in December, 1935.

He was treated by a local physician until January 1, 1936, when he was placed in the care of a skilled orthopedic surgeon in Pittsburgh and there hospitalized on February 5, 1936. On February 28th, the fracture was reduced under an anaesthetic and a plaster of paris case was applied. He was discharged from the hospital on March 23rd after what is described as "an uneventful recovery". His health deteriorated and he died on October 2, 1936. Claimant contended that death was due to asthma with resulting dilatation of the air cells of the lungs; and emphysema; and that this was brought about by a cold or chill suffered when a patient in the hospital, either during the operation or immediately thereafter. The company contended that death was a result of a cardiac condition which caused the asthma, or due to a pre-existing asthma, and that neither of these conditions was caused by the accident. They further denied that the patient suffered any chill or cold while in the hospital.

Contention was that the patient suffered the cold or chill by reason of the application of a cast of plaster of paris, having been put on the decedent's leg when he was a patient. The medical experts contended that the application of the wet plaster of paris cast has a tendency to produce heat next to the skin, but that the nervous shock would give the impression of cold. The record revealed no history of chill, cold, excess temperature or complaint of them, or anything indicating bronchitis or cold, during the period of time that the decedent was in the hospital. The nurses testified that they were present in the ward in which the patient was received after the operation; that they did not note any coldness in the temperature. As a matter of fact, stated that they probably would have noticed such a condition if it had existed, because the ward was invariably warm.

Compensation was disallowed as the evidence failed to establish claimant's condition was due to asthma resulting from a cold or chill contracted while a patient in the hospital.

Phillips vs. B & N Oil and Gas Company, et al,
Supreme Ct. of Pa., July 17, 1947
54 Atlantic Reporter, 2nd series, Page 52

IMMEDIATELY POPULAR

Bradley Postwar-Designed All-Metal Washfountains

The ultimate in modern, sanitary group-washing equipment, these durable enameled iron and stainless steel Bradley Washfountains merit their quickly won popularity. They fill the need for a highly sanitary fixture that is acid-resistant and capable of withstanding the severe abuse to which Washfountains in industrial plants or institutions are sometimes subjected.

Eight to ten people are accommodated simultaneously at the 54″ Washfountain thus making possible unusual savings in water consumption, space, maintenance and piping connections; also available in 36″ size. Distributed through plumbing wholesalers . . . BRADLEY WASHFOUNTAIN CO., 2259 West Michigan Street, Milwaukee 1, Wisconsin.

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BRADLEY *Washfountains*

Injury During Lunch Hour

MATILDA DESAUTEL was an employee in the State Institution for the feeble minded at Grafton. On October 22nd, 1940, she was injured and contended that the injury sustained was during the course of her employment, as an employee of the institution.

Facts reveal that claimant commenced work as an attendant in the children's ward in the institution in 1933 and continued as such until the time of her injury; that it was her duty to supervise children in her ward and see that they were properly taken care of.

Under the terms of her employment, she commenced work at 6:00 A. M. and worked until 7:15 P. M. She was allowed 3½ hour periods for rest and refreshment. One in the morning and one in the afternoon. Between these two, she was allowed what is denominated as a lunch period of one-half hour. No definite time for this period was fixed. Claimant had no control over the lunch period as they were fixed by the supervisor and claimant was required to conform with hours so fixed. She was employed on the terms that she would live outside the institution and not take her meals there. She had always gone home for her lunch and there had been no objection on the part of the superintendent or anyone who supervised her work. On the date and time of the accident, in accordance with the established custom, she left the institution and walked to her home. After she had left the institutional grounds and was nearing her home, she stepped into a depression and as a result she fell and fractured her ankle.

Question raised in the instant matter was whether or not the accident occurred while in the course of her employment. What constitutes an incident of employment for persons under the Workmen's Compensation Act is determined not only on original agreement, but upon such modifications as may have been made either expressly or impliedly by the parties. Therefore, a custom that officials of the institution acquiesced over a period of years that a employee had lunch at home and injury sustained by the employee while walking to and from her place of employment and her cutsomary place of having lunch is compensable under the Workmen's Compensation Act.

Claimant was required to confine herself to the work until the one-half period allotted for lunch, during which time she would have to go home, eat her lunch, return to the ward and take up her work with the children.

The time was not fixed and claimant was under the control of the employer. It is clear that under the circumstances, the claimant could not go and shop for lunch at the various restaurants in town or a neighboring town. The arrangement was mutual. The injury was sustained while in the course of employment.

Desautel vs. North Dakota Workmen's Compensation Bureau, Supreme Ct. of N. D. July 10, 1947, 28 North Western Reporter, 2nd series, Page 378.

in a word--

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For comfort——
For attractiveness

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WEATHERPROOF

A cabinet type bulleting board (4 in. inside depth) with hinged glass door to protect contents. Size 28 in. x 35 in. x 4 in.

The "Safety Bulletins" panel is of opalescent glass with the wording sandblasted and filled in with green enamel. Modern lumiline lighting shines through the top panel and over the entire inner area.

Special Boards to Order
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IPCO
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INDUSTRIAL PRODUCTS COMPANY
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What Is An Accident?

THERE is a great deal of confusion in the minds of many people, including even some safety engineers, as to what is meant by the term "accident." We often think of accidents only in terms of injuries.

This confusion of accidents and injuries is a natural result of the fact that accident records are based on injuries and claims are based mainly on injuries. It will greatly help in preventing accidents to keep clearly in mind the difference between injuries and the accidents which cause them.

Let us define an accident as any occurence which interrupts or interferes with normal operations. A man trips while walking, a cook spills hot grease in the galley, a wiper drops a wrench from an upper grating. These all can be classified as accidents under the above definition.

Are they serious? The man who tripped may recover himself with no harm or he may fall to the next deck and be killed. The cook may merely have to wipe up a mess or may have severe burns over his arms and body. The wrench may land harmlessly on the floor plates or may crack a man's skull.

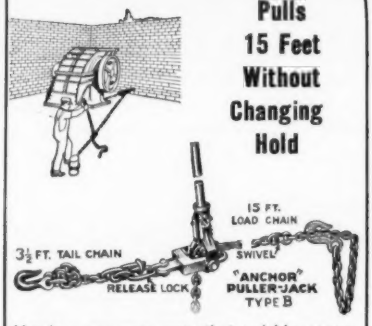
The accidents which cause no injuries should be considered important enough to be studied as carefully as those which kill a man. For one thing, it is easier to get the facts on a no-injury accident than on one for which compensation claims may be made.

There is little reason for anyone to try to cover up the facts. In most cases some unsafe act is involved in an accident. Perhaps the man or men involved can be made to see the probability of injury in a continuation of the unsafe practice and can be persuaded to follow a safe practice before they are injured by a repetition of the accident.

Furthermore, a study of the causes may reveal a hazard which can be removed by some change in the conditions under which the men must work or the method which is being followed. Perhaps the need for some guard or other protective measure will become apparent.

The chief advantage of studying all accidents rather than only those which cause injuries lies in the fact that in many types of accidents the former may outnumber the latter ten or more to one. Thus if steps are taken to prevent the no-injury accidents, the injuries can be prevented.—*Accident Prevention Bureau Waterfront Employers Assn. of the Pacific Coast.*

***One Man* Moves 5 Tons with the ANCHOR Puller-Jack!**



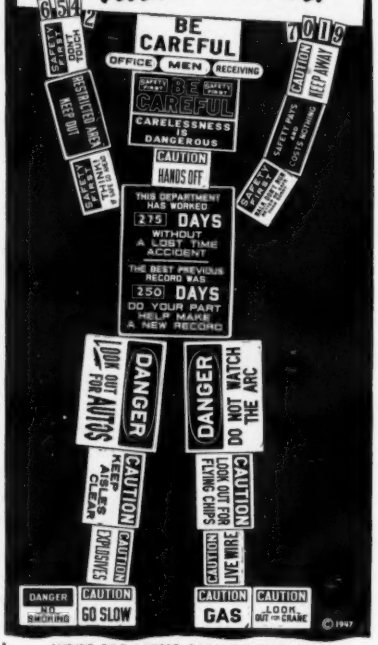
Pulls 15 Feet Without Changing Hold

Here's a one-man gang that quickly repays its price in labor, time and money saved. Has 3 tons direct pulling power, or 5 tons with sheave block. Can be operated upright, sideways or upside down, with lever pull away from load or toward it. Simple, strong, foolproof. Practically nothing to get out of order. Positive action, always holds. Compact, quick and easy to set up and use. Hundreds of uses for this powerful tool wherever heavy objects must be moved. Order an ANCHOR Puller-Jack today, or write for descriptive catalog.

$57.50 F. O. B. Bowerston, Ohio. Jack complete with 3 ft. steel tube handle, 15 ft. load chain with slip hook, and release lock. Longer chains available.

THE NOLAN CO.
(Formerly The Mining Safety Device Co.)
DEPT. O.H. . . . BOWERSTON, OHIO

A SAFE WORKER IS A *Faster Worker*



WRITE FOR LATEST CATALOG SHOWING
SAFETY SIGNS* FOR *ALL PURPOSES

STANDARD SIGNS, INC.
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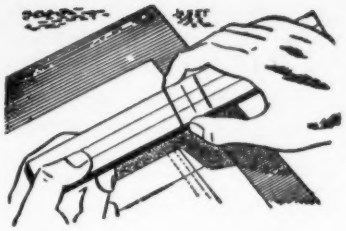
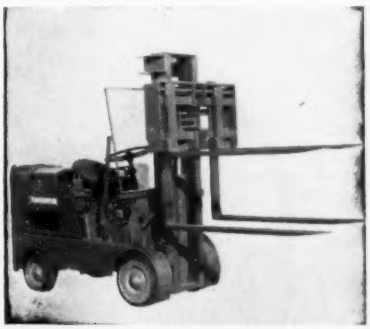


New PRODUCTS

For further information on any of these products, simply list the key number at the head of each item on the special post card enclosed with this issue.

NP 235 — PROTECTION AGAINST FURNACE HEAT—A large, heat-reat-resistant glass shield to protect operator from furnace glare and heat,



fender guards to provide similar protection for front tires, and a double set of forks which permit handling of two containers simultaneously are the special attachments featured for Towmotor fork lift trucks used to charge heat ovens.

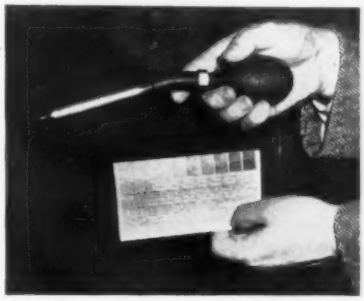
NP 236 — SAFETY MAT — New safety underfoot for industrial workers is promised in the announcement of a new type industrial safety mat by the National Mat Company, Inc. A development of the link wood block mat widely used in all types of industrial plants, the new mat represents another application of Minnesota Mining's "Safety-Walk," a non-skid mineral surface material uneffected by oil, grease, gasoline, water and most acids and alkalis. The new mat retains the advantages of plain link wood mats and has the advantages of longer life and complete safety underfoot even under the most severe conditions.

NP 237 — INDUSTRIAL HAND CLEANER— The Arrow Sales Company have developed an industrial hand cleaner that not only cleans away surface dirt, but liquifies at body temperature and penetrates deeply into the skin pores to float away all traces of stubbornly embedded paint, aluminum, grease, tar, pitch, shellac, rubber cement, carbon and other substances which present a difficult hand cleaning problem. The product, "SPOOK", contains no abrasives or other harmful ingredients. It is non-greasy and pleasantly scented, and easy to use. Said by the manufacturers to have been used and highly approved by the Navy, it is merely rubbed on and

wiped off on a dry cloth or paper towel, almost instantly cleaning the hands.

NP 238—SAFETY MITTEN— Built to the specifications of a large Northwestern mill, the Industrial Gloves Company have just developed a mitten which appears to be ideal in meeting the requirements for handling lumber in saw mills. Made of plump weight Chrome Tanned Cowhide, the mitt is left open at the finger tips so that wood particles and chips entering in at the wrist end can be easily expelled without removing mitten. The thumb is seamless across the palm; a folder strip of leather is inserted in the closing seam and then double stitched with steel. The mitt is reversible and can be worn on either hand.

NP 239—CARBON MONOXIDE DETECTOR—The United States Safety Service Company has been licensed by the government to manu-



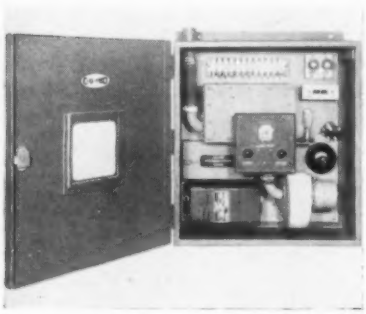
facture the carbon monoxide instrument used extensively during the war (see the article entitled "NBS Colorimetric Carbon Monoxide Indicator" which appeared in the October Show issue of OCCUPATIONAL HAZARDS). The instrument will detect and estimate less than one part of carbon monoxide per 500 million parts of air which is long before the poison becomes harmful.

NP 240 — RETRACTABLE TRUCK STEP— The Extendo Corporation are

the manufacturers of the new EXTENDO NO BREAK TRUCK STEP. The outstanding feature of this step is that it will not break off should the driver forget to retract it. The unit merely slides back into its frame or rack if the truck is backed up against a wall, dock or other obstacle. The step is attached to the truck by four bolts and is considered a time saver, labor saver and an injury saver.

NP 241—SPECIAL AMMONIA LEAK SUIT—Armstrong Supply Company announces a special ammonia Leak Suit and Mask for the ice cream, frozen foods, refrigeration, meat packing and dairy trades. The suit is designed to protect the wearer from extremes of heat and cold as well as protection from direct spray of ammonia, chloride, etc., and completely prevents exposure of any part of the body from head to foot. The entire suit can be put on ready for use by anyone in less than two minutes and requires no special training.

NP 242—SMOKE DETECTOR—announced by the C-O-TWO FIRE EQUIPMENT COMPANY is a new industrial smoke detector, designed to detect fire in fur, storage or record vaults and other spaces in industrial plants. The manufacturers claim that



this smoke detector, with an enclosed light beam, is the first to be fully approved by the Underwriters' Laboratories and operates on the principle of light reflected by smoke particles on to a photo-electric cell. At the first sign of smoke, a red smoke-indicating lamp is lighted and an alarm sounds.

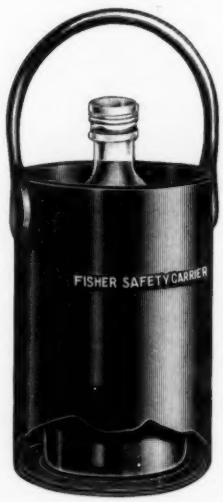
NP 243—SUCTION HOOD— The accompanying photograph shows a TORIT No. 19-FM Dust Separator connected to a Gallmeyer and Livingston No. 45 Surface Grinder with the over-under suction hood employed by the Torit Manufacturing Company. Note that the upper section of the over-under suction hood

is attached to the grinder head and the lower section mounted on the bed of the grinder. The entire assembly is adjustable according to requirements of each and every grinding operation. The effectiveness of the unit can be measured from the photo as the picture was taken after the grinder had been in operation a considerable length of time, and the grinder was not cleaned off prior to taking the picture.

NP 244 — FIREPROOF COATING — Announcement of a new, fireproof, general maintenance coating, Amercoat Special Solution #1322 for areas where a fire resistant coating is necessary, has been made by the manufacturers, Amercoat Division, American Pipe and Construction Company. To satisfy Federal Specifications, CCCD-746, for fireproof coatings, the solution was applied to canvas and held in a 1½" flame for 12 seconds. Charred area was less than 3½ inches and flame ceased within two seconds after removal. The solution is said to be anti-corrosive, acid, alkali and salt resistant.

NP 245—SKIN HEALER—Severe industrial skin irritations from caustic cleaning solutions or bright nickel solutions, chromic acid burns, cyanide itch and irritation caused by lubricants such as sulphur-based cutting oils are reported remarkably remedied through use of a new cream developed by The Tarbonis Company. Cream is pleasant, odorless, greaseless, stainless and claimed not to soil hands, clothing or work. Not only a treatment, it is said also to be a protective against many industrial irritants which cannot be avoided.

NP 246—BOTTLE CARRIER— The unique, new molded rubber Fisher Safety Bottle Carrier is said to solve a serious accident problem present in most laboratories. The Fisher Scientific Company claim that it is no longer necessary to carry corrosive acids and other dangerous re-agents without adequate protection. The new Carrier protects both



the bottle being carried and the person carrying the bottle. It is molded in one piece of rubber with a special circular ridge molded on the inner surface of the bottom of the carrier so that the bottles will always be centered.

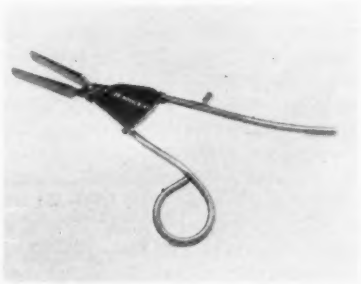
NP 247—ANTI-SLIP WAX— Vestal Laboratories announces the development of an anti-slip wax guaranteed to be non-tacky. The product, Vesta Gloss, is approved by the Underwriter's Laboratory. It produces a long-wearing wax finish that stands up

under the heaviest traffic. Approved for use on all types floors; terrazzo, asphalt tile, rubber tile, linoleum, wood and composition. Available in quanities, and packaged in containers ranging from 5 gallon pails to 55 gallon drums.

NP 248—SHATTER-PROOF SANDING DISC—A shatter-proof sanding disc has been perfected by the Milwaukee Motive Manufacturing Company. Made of a new type resin bond and

a newly developed backing material, the disc is said to hold together under most severe strain, burring over the worst, but not chipping into pieces when hitting obstructions. Because of this safety feature, workers are able to get greater production without interruption or injuries.

NP 249—NEW SAFETY TONGS—New safety tongs with a finger guard for extra protection and faster work



handling are being manufactured by the Wolverine Tool Company. Tongs are of drop-forged steel—very light in weight—sturdily constructed. The long, thin soft iron nose prevents die breakage. These tongs are said by the manufacturer to be necessary equipment in handling material on punch presses or other operations where the hand requires protection.

NP 250—ARCH GUARD— Trinal Inc., have developed a new metatarsal arch guard, SAFEET, for protection of the metatarsal arch and for additional protection for the foot when worn with the safety shoe with steel toe-cap. SAFEET is said to devise its protection for the arch by ingeniously distributing the potential impact of a falling object upon its ribbed re-enforced arch shield, across two widely separated bearing surfaces. SAFEET are shaped to fit both the left and right shoes and are made in four sizes. Minor adjust-

ments can be made that permit a perfect fit for any foot and shoe size.

Plus Value GLOVES

Hand Safety *and* Positive Grip

Stanzoils

Stanzoils at work in hundreds of plants have proved 2 advantages: (a) extra-long protective life of milled (not latex) DuPont neoprene in harmful liquids, low-cost per hour protection against costly injury claims; plus (b) Pioneer's amazing non-slip finger finish that gives workers new assurance and speed. Standard sizes, styles and weights. Insist on plus-value Stanzoils at your suppliers — or write for facts!

Red Stanzoils for Safety... Sturdy canvas work gloves bond-coated with liquid-safe neoprene.

STANZOIL PIONEER

Synthetic Rubber Division

THE PIONEER RUBBER COMPANY

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OVER 25 YEARS OF QUALITY GLOVE MAKING

EXTREMELY TOUGH—

HIGHLY RESISTANT TO ACIDS — CAUSTICS — OILS AND GREASES

Neoprene Latex INDUSTRIAL GLOVES

4 POPULAR STYLES

★ **No. 5760-5**, 18" LONG
EXTRA LONG GAUNTLET
GAUGE .030 TO .040
SIZES 10, 11

★ **No. 5737-2**, 14" LONG
LONG GAUNTLET
GAUGE .030 TO .040
SIZES 9-10-11-11½-12

★ **No. 5705-5**, 11" LONG
SHORT GAUNTLET
GAUGE .020 TO .025
SIZES 9-10-11

★ **No. 5702-5**, 10½" LONG
LIGHT DUTY
GAUGE .010 TO .012
SIZES 7-8-9-10-11

REQUEST SAMPLES AND PRICES

SEIBERLING LATEX PRODUCTS CO.

AKRON, OHIO

200 - 5th Ave. Bldg., New York Merchandise Mart, Chicago

FLOOR MAINTENANCE
From Page 14

is strong with alkalies which cannot be dissolved completely in water, a white powder will be left on the floor after the water has evaporated. More labor will be required to remove the powder and the alkali is almost certain to spoil the top surface.

The matter of the water rinse is also essential to good floor maintenance. Despite careful work methods, some dirty soap water will be left on the floors. This wash water must be removed by using a clear rinse. The common two-compartment washing pail, one with wash water and one with rinse water, is excellent for insuring a wash and a good rinse without wasted motion or lost time.

Water from 115-130 F. has been found to give the best and most economical results for cleaning most types of floors. Rather than a special temperature for each type of flooring, it is best to use only lukewarm water for all floors. Cold water, out of a faucet, sets the dirt more firmly on the floor and increases the amount of labor required to remove it. Hot water is apt to crack most hard floor surfaces by expansion. Hot water on linoleum and wood surfaces is especially harmful over long periods.

Materials and Equipment

From a cost viewpoint, the selection of cheap maintenance materials which requires many dollar's worth of labor is not good business. It is far more important to see that labor is effectively employed. In any selection of the items which make up a good maintenance program, it must be remembered that only a small per cent of the entire cost is spent on cleaning compounds, machines, brushes, rags, oil absorbents, floor coatings, non-slip paint, resurfacing materials and the like. Scrubbing and polishing machines, for instance, are accepted by those responsible for maintenance programs as good investments which soon pay for themselves in labor savings. One machine scrubber and one operator can do better work in less time than several hand moppers.

After a practical and effective floor maintenance program has been set up for the individual plant, preferably with the help of an experienced floor maintenance expert, management can then look over the market for the equipment which will best serve their purposes.

Absorbents—Oil and Grease

Earlier in this article, it was pointed out that many plants have "abnormal" floor conditions inasmuch as these floors are continuously exposed to deposits of large quantities of oil and grease. When such conditions exist, and an expert floor maintenance man is called in, he will probably prescribe some sort of oil or grease absorbent to reduce accidents due to slipping, to minimize fire hazards caused by exposed oils, and to keep floors dry and clean. These absorbents are used around the base of screw machines, and on wood floors or wood blocks where workmen walk, and also in aisles and on slippery floors or steps. They protect employees against underfoot accidents by giving them cleaner, safer and dryer floors.

Maintenance Machines

An important part of most maintenance programs is the electrically operated floor machines which sweep, clean, polish, remove dust from wood, concrete, asphalt, tile, linoleum, rubber, terrazo and various composition floors with a minimum of effort. These machines are equipped with a variety of attachments which make it possible to accomplish every type of floor finishing job, including scrubbing, grinding, steel wooling, polishing, troweling, waxing and dry scrubbing.

Polish—non-slip

Non-slip polish eliminates the dangers inherent in slippery water-base wax, and is at the same time an excellent floor finish for use in many industrial floors. Such polish will not only add beauty to such floors as linoleum, cork and tile, but after application furnishes the floor with an outer coating that helps add to the life of the floor. It is important, of course, that the maintenance crew be instructed in the proper method of cleaning such polished floor so as not to destroy the outer coating and subsequently the entire surface.

Sweeping Compound

In the preservation of all types of industrial flooring, sweeping compounds are employed to insure attractive and safer underfoot surfaces. Again it is advisable to secure the manufacturer's advice as to what type of sweeping compound to use on certain floors, as serious floor damage can be done by use of the wrong kind of compound. As a usual rule, ordinary sweeping compounds are not recommended for removal of flammable materials.

Resurfacing Materials

The problems of resurfacing floors which have deteriorated because of faulty maintenance methods, age, wear and tear, should not be entrusted to the hands of the maintenance foreman without first calling in a specialist in such problems to analyze the individual problem. The practice of handing a maintenance crew member a bucket of cement with the instruction to "fix up those holes" is a costly one to management in view of the fact that besides the labor costs involved, the job is not done correctly and will only have to be done over again in a short time.

Resurfacing material for floors will repair ruts and holes and will provide a smooth, safe, clean surface that withstands the wear attendant upon trucking activities and chemical disintegration. Many of these materials can be correctly applied by plant maintenance crews after instructions are given them by the manufacturer of such material. Concerning these resurfacing materials, it is well to keep in mind that, as there is no such thing as a "standard" maintenance method which covers maintenance of all types of industrial floors, so there is no such thing as a "standard" resurfacing material which can be used to repair all types of floors. Management should call in experts before making any attempt at resurfacing worn out floors in order that they may be sure that their investment in time, labor and supplies will result in a permanent resurfacing job.

Brushes and Brooms

This equipment is used in connection with many types of floor dressings and are used to pick up dust, sweepings and shavings for the purpose of preventing falls, fires and general good housekeeping. Elimination of dust and dirt from flooring through the use of vacuum cleaning reduces the incidence of respiratory disease from air borne bacteria. However, brushes and brooms do have their place in maintenance work. The most common brooms are made of broom corn from Ilinois, Kansas, Missouri and Oklahoma. Panama reed brooms with leather or rubber jackets is believed by many to be cheaper by long term cost analysis. The initial cost is high, but their life is about 3 times that of corn brooms. For sweeping ce-

ment floors, garages, basements, etc., a reed broom is a good choice.

Vacuum Cleaners

Vacuum cleaning in industrial plants is done by portable cleaners or connections with a central system. These commercial vacuum cleaners are essential equipment for every cleaning crew and most maintenance crews. They are used for removing dusts, dirt, grit, etc., from floors in machine shops, processing plants, mills, etc. The removal of these foreign substances from flooring aids plant sanitation and removes slipping menaces that constitute a hazard to employee welfare. Health levels are raised by removal by vacuum of bacteria-laden dusts. Attachments make possible the removal of dirt and dusts from walls, overhead piping, etc. It is recommended of the portable cleaners that the bag be emptied daily at the end of the work period. This frequent cleaning may seem unnecessary to many, but the work output, of "dirt intake" in this instance, of a clean bag far exceeds that of a dirty one.

Cleaner for Floors

Floor cleaners of different composition and adapted for many diversified types of floors are available for treating practically any industrial flooring. Floor cleaners remove dust and stains of traffic, assist in elimination of scrubbing and damp mopping and promotes the preservation of the floor—so reducing the slipping and falling hazards which is the major aim of good floor maintenance.

Cleaners for rubber floors are entirely water resistant and fast drying, forming a protective coating for either rubber or soft composition floors. It preserves flooring from oils, air and friction of traffic and makes the rubber floor easier to clean, eliminating the need of frequent scrubbing which is harmful to any type floor.

Floor Coating

Floor coating is available for use on concrete, steel, and wood flooring to provide protection against the corrosive effective of acids, alkalies, oil and water. They can be non-slip, static resistant, or combine both qualities. The non-slip qualities of this floor coating render it desirable in many industrial establishments to help safeguard personnel from slipping and falling accidents. The static resistant qualities of floor coating minimize the hazards of static electricity in a variety of industrial processes. This coating is used in hazardous areas such as munition plants, textile plants, work benches, around machinery, fuel tanks and where flammable vapors and dusts may be ignited by static electricity.

Mop Trucks

Mop trucks are available for every floor are in a variety of models which are suitable for varied industrial requirements. Mop trucks furnish an abundant supply of clean water at the spot where the mopping is in progress and furnish a means of quickly ringing the mops. Some models are equipped with double compartments—one for wash water, the other for rinse. These trucks are easily moved and are built to withstand hard usage.

Paint—non-slip

To protect floor surfaces on ramps, floors, and walkaways, and at the same time to provide added protection against slipping and falling, floor paint containing a non-slip ingredient is available on the market.

FOR WET, GRIMY JOBS, IN CLEANERS, OILS, GREASES
it's Redmont
by Edmont
A safer, longer wearing glove for the tough spots. Rubber reinforced by a strong, yet extremely flexible fabric—resists snags and tears. Now made in a new, wider thumb-span pattern, curved thumb and fingers — it's more comfortable, easy on and off. Special synthetic rubber is oil and grease-proof.
LOOK FOR THE RED BAND
Made in 10" 12" and 14" cuffs, also knit wrist style.
Edmont
Fabric-Lined RUBBER GLOVES
Edmont Mfg. Co. Orange St., Coshocton, Ohio

This is
Inland 4-Way Floor Plate
SAFE!
ECONOMICAL!
EASY TO INSTALL!
Carried by all leading Steel Distributors...Write for Catalog
INLAND STEEL COMPANY
38 S. Dearborn Street Chicago 3, Ill.
Sales Offices: Detroit, Indianapolis, Kansas City, Milwaukee, New York, St. Louis, St. Paul

PUTTING THE HEAT TO ICY SIDEWALKS

It is impossible for pedestrians to slip on ice while walking on the sidewalk in front of the Williamson Building in Cleveland, Ohio, this winter. Ice has about as much chance on that sidewalk as the proverbial snowball has in Hades. During the summer steam pipes were installed under the walk (see picture) and now the snow flakes melt as quickly as they fall. "We made this improvement," said Stanley M. Buckingham, managing agent for the Williamson Co., "in the interest of safety. It is the first installation of its kind in Cleveland." This idea could be applied to industry for added safety.

Built-In Explosion Protection with MASTERPLATE Sparkproof Static-Disseminating Floors . . .

Where industrial processes involve explosion gases, liquids and dust conditions, Masterplate floors have become mandatory because they are sparkproof and static disseminating.

In addition, Masterplate floors are non-slip, dustless and have great durability — frequently wearing 4 to 6 times longer than plain concrete floors under the same conditions.

Masterplate provides these advantages because it produces a *thick* iron-concrete armorplate which is made possible by Master Builders Dispersing Agent, an exclusive feature of this product.

Where sparkproof, dustless, non-slip, easy-to-clean and long term economy features are desired for floors subjected to heavy traffic, specify Masterplate. It comes in plain and nine colors.

Write for Masterplate Pictorial Specifications booklet.

the MASTER BUILDERS Co.

CLEVELAND 3, OHIO TORONTO, ONTARIO

Preserving Material

Such materials provides resistance to heavy trucking, excessive water, acids and other destructive matter which eventually destroys the flooring. Preserving materials are used to help preserve floors in food processing plants, dairies and breweries and wherever sanitary conditions and health of the worker might otherwise be jeopardized.

Conclusion

Roughness, slipperiness from wear, holes, splinters, and poor patching contribute heavily to the two classes of injury that are commonly most numerous in industry, namely "handling" and "slipping, tripping, and falling."

These hazardous conditions of floors are caused, in the majority of cases, by faulty floor maintenance. This condition is allowed to exist in many plants because the job of floor maintenace is oftentimes considered "janitorial" work. As such, it is not closely supervised, and the job of maintenance is often put into the hands of sub-marginal workers at sub-standard rates.

The responsibility of floor maintenance should be the plant safety engineer's, because the relationship between floors and plant safety is a close one. *How can the safety man reduce slipping and falling accidents in his plant if hazardous slipping conditions prevail on floors over which he has no jurisdiction?* It is management's responsibility in order to reduce costly slipping and falling accidents to assign the safety engineer all, or a considerable portion of the responsibility of the floor maintenance program.

Once the engineer is given this responsibility, he should ask the help of a trained and experienced floor maintenance expert to go over his entire plant with a view toward eliminating all slipping, tripping, and falling hazards. The resulting maintenance program will pay for itself many times over by fewer accidents, fewer compensation payments, reduction in insurance rates, increased worker efficiency, longer life to the floor themselves, savings in maintenance costs, and beautifully kept premises that will add much to the prestige of the plant.

TECHNICAL FILE ON METAL POISONING

SAVE THIS VALUABLE REFERENCE MATERIAL: BUILD UP A PERMANENT OFFICE FILE

C 156. EFFECTS OF EXPOSURE. Symptoms or signs of manganese poisoning usually appear only after several months' exposure as the absorption of the toxic dust or fume is cumulative. These symptoms usually consist of languor and sleepiness, stolid and mask-like face, low and monotonous speech, twitching of the facial muscles, or even tremors in the body and extremities.

C 157. INDUSTRIAL CADMIUM. Cadmium is a silvery-white metal element, or a gray-white powder, found in small quantities in zinc ores. Specific gravity of the metal is 8.64, the melting point is 320.9 degrees Centigrade and the boiling point is 767 degrees Centigrade. Cadmium is soluble in acids. It is rarely used as the pure metal, the overwhelming modern use being as a constituent of alloys or in compound form. Cadmium is ductile, malleable, capable of taking a high polish, and is unusually resistant to corrosion or rust. The latter accounts for its wide use in electroplating.

C 158. ACUTE POISONING. Because cadmium is soluble to some extent even in fruit juice acids, cadmium-plated containers have caused acute poisoning, even from minute amounts that have dissolved in refrigerator trays of lemonade. Fortunately for the victim, however, cadmium also has an emetic action.

C 159. HAZARD FORM IN INDUSTRY. In industry, cadmium usually is a hazard in the dust or fume form and is absorbed mainly through the respiratory tract. The incidence of chronic cadmium poisoning is increasing and will probably continue to do so, since new uses for the metal are being discovered daily.

C 160. MAJOR HAZARDS. The most important hazards reveal themselves in the smelting of ores, in the making of alloys, in plating, spraying and welding. The yellowish-brown fumes given off when the oxide is heated are reported to be particularly toxic.

C 161. HARMFUL EFFECTS. Cadmium poisoning occurs more frequently in industrial operations than is generally recognized. Because it is used so often with other metals and because it has a somewhat delayed action on the worker, the resulting illness is not immediately associated with cadmium exposure, but is treated as a simple metal fume fever.

C 161. SYMPTOMS OF POISONING. The first symptoms of acute cadmium poisoning is a distressing cough, sometimes followed quickly (but sometimes not for several hours) by headaches, dizziness, shortness of breath and a constrictive pain in the chest. Cadmium is the only industrial metal poison known to cause these distressing conditions. Dryness of throat, as well as nausea and vomiting, may accompany the early symptoms. The victim later experiences chills. When the lungs are so damaged that they can no longer provide the blood with oxygen, fever sets in and the victim usually dies.

C 162. INHALATION. Inhalation of the dust or fumes is the main cause of trouble. Cadmium has a high toxicity and causes violent, permanent damage by inflaming and thickening the terminal air sacs of the lungs, shutting off the air supply to the blood. Destructive deposits of absorbed metal also take place in the liver, kidneys, spleen and pancreas. Death due to pneumonia is frequent, but lung inflammation is considered chemical rather than infectious.

C 163. WORKERS EXPOSED. The following workers are exposed to cadmium poisoning: Cadmium platers, color makers, electroplaters, glass colorers, lead smelters, lithopone makers, metallizers, solderers, solder makers, zinc smelters and refiners.

C 164. TREATMENT. Even in cases of brief, very mild exposure to a cadmium hazard, the worker should be removed from the job immediately and placed under a doctor's care. After a week or two of rest in bed, the recovered worker is usually permitted to return to his job if the hazard has been removed. Treatment during this period follows that given for ordinary respiratory infections as, for example, the administration of drugs, gargles, irrigations, inhalations, and so on. At the end of his period of rest the worker usually returns to his job free of symptoms. When the case is one of either moderate or severe exposure, it is recommended that the worker be hospitalized immediately and placed under an oxygen tent. This will provide relief for the condition of air-hunger that usually exists.

C 165. PRECAUTIONS. Because cadmium is so deadly, all persons using it or being exposed to cadmium hazards, should be forewarned. Cadmium-contaminated air should be tested frequently to insure safe concentration limits. The American Standards Association in November, 1941, set permissible concentration at 1 milligram per 10 cubic meters of air. Workers should be examined regularly for physical fitness and, when required to work in close contact with cadmium fumes, should be forced to wear approved respirators.

TECHNICAL FILE ON METAL POISONING

SAVE THIS VALUABLE REFERENCE MATERIAL: BUILD UP A PERMANENT OFFICE FILE

C 166. EXHAUST SYSTEMS. All cadmium operations should be enclosed or exhaust systems installed to remove any fumes. Good housekeeping techniques of clean floors and work benches apply here in doubled importance because of the highly toxic nature of dust and fumes.

C 167. AIR-SAMPLING. For air-sampling the work room suspected of cadmium concentrations, the following guides have been set up by the American Standards Association:

1. Air samples should be truly representative of the actual working conditions.
2. Air samples should be taken wherever exposure to cadmium is known or suspected.
3. Air samples should be taken at the breathing level, close to the mouth or nose of the worker, giving special attention to the origin of the hazard and the path of air currents.
4. Air samples should be numerous enough to follow the working day variations. Analytic methods, commonly used on the air samples, are based on colorimetric comparisons.

C 168. INDUSTRIAL CHROMIUM. Chromium is a very hard, steel-grey, or bluish-white metal, not found in free form, but occurring most frequently as an ore called chromite. The specific gravity is 6.92, melting point is 1615 degrees Centigrade, boiling point is 2200 degrees Centigrade. The metal is soluble in dilute mineral acids other than nitric. It is strongly resistant to corrosion, but not to attacks of caustic alkalis. It takes a high polish because of its hardness, and resists heat because of its high melting point. Although the metal itself is not considered poisonous, the occupational damage of industrial chromium from its compounds and derivatives, like chromic acid, can be very severe.

C 169. INDUSTRIAL USES. Apart from the stainless steel industry, chromium is used in electro-plating, rust-proofing, pigment manufacturing, tanning, blueprinting, photography, lithography, and the chemical industries.

C 170. HAZARDS. Hazards usually result from:

1. Handling the dry material, either in dry crystal form, or as a fine powder.
2. Contact with solutions of chromium.
3. Contact with the atmosphere containing the material in the form of a dust, vapor, spray or mist.

When the chromium is compounded with lead or any other toxic agent, as in the making of dyes and dry colors like chrome yellow, orange, green, or red, the result can assume the form of chronic lead poisoning as well.

C 171. EFFECTS OF POISONING. Chromium poisoning is usually a chronic disease resultnig in one of the following:

1. Irritation or ulceration of the skin and the nose and throat linings.
2. Inflammation of the upper respiratory tract.
3. Secondary infections, such as bronchitis, kidney disease, or allergic reactions of the system, like asthma or fever.

Some chromium compounds have a very painful, caustic action on the skin and mucuous membranes, causing a skin irritation with diffuse inflammations, blisters or elevations. The regions attacked are the fingers, hands, face and even the chest and feet.

C 172. CHROME ULCERS. When the skin is cut, cracked, or otherwise broken, the action penetrates to the deeper layers and forms chrome ulcers or chrome holes. These are not usually painful, but present, around the bordering tissues, a dangerous opportunity for the development of a secondary infection. The ulcers usually leave permanent scars. They develop slowly and heal slowly, often taking weeks to subside even after removal from the hazard. Their most frequent location is at the roots of the nails, the creases of the knuckles, and the hairy part of the back of the hands and forearms.

C 173. RESPIRATORY TRACT. When inflammation attacks the upper respiratory tract, the most vulnerable spot is the portion between the nostrils (septum). This becomes ulcerated at the point where inhaled dust settles first, and within the space of one week can almost painlessly perforate the portion with permanent holes. Ulcers of the tonsils, palate and larynx have also been reported. When an inhaled chromium dust or mist penetrates beyond the upper respiratory tract, it does not itself produce a chemical bronchitis, but does increase susceptibility to infectious diseases among chrome workmen. Chronic bronchitis is frequent in such exposures. In rare cases, some chromium platers have suffered vomiting spells that come on suddenly and immediately following taking of food.

To Be Continued

lar care to prevent further leakage. Remove them to a safe place where the leaking can be stopped. If faucets are used, they should have short shanks threaded with Briggs standard straight pipe threads. A resilient gasket of suitable material should be used to insure a tight fit. At all times bear in mind that heavy concentrations of vapor are toxic, so protect workmen from vapor and liquid. Safety cans should be used to handle small quanities of CCl_4 to avoid contamination of workroom atmosphere. Uncovered pails or other containers should be prohibited. Spills should be cleaned up by employees provided with adequate personal protective equipment and rags or mops should be placed in closed containers after use until they can be dried safely under a ventilator or outdoors in a suitable location.

Personal Protective Equipment

No personal protective equipment should be used as substitute for good, safe working conditions or for adequate ventilation. Such equipment—while it will for the time being protect the individual wearing it—may leave others in the working premises exposed to the hazard.

Mechanical equipment requires regular inspections, cleaning and maintenance. This is especially true of industrial gas masks, since the canister contents become exhausted in time.

Employees who may be subjected to severe exposure to CCl_4 vapor as in tank and equipment cleaning and repairs, in intermittent operations where general ventilation is not practical, in small operations such as spot cleaning if frequently repeated, in cases of failure of piping and equipment, and in cleaning up spills—should be provided with proper respiratory protecting approved by the Bureau of Mines as follows:

a. Suitable gas-tight safety goggles.
b. Rescue harness and life line for those entering a tank or enclosed storage space; and outside attendant should keep constant observation until job is finished.
c. Hose masks with hose inlet in vapor-free atmosphere, air-line masks with proper reducing valve and filter suitable for use only where conditions will permit safe escape in case of failure of the compressed air supply, or self-contained breathing equipment with stored oxygen or air, which allows greater freedom of motion but require more highly trained men.
d. Industrial gas masks, approved by the U. S. Bureau of Mines with canisters approved for use in carbon tetrachloride vapor, should be used only when it is certain that the concentration of vapor is less than 2 percent and when there is not atmospheric oxygen deficiency.
e. To prevent dermatitis or other effects of direct contact of CCl_4 with the skin, employees should be provided with:
   1. Gloves and aprons fabricated from, or impregnated with, the polyvinyl alcohol plastics or Neoprene.
   2. Acid-type goggles where there is danger of splashing.
   3. Safety equipment and clothing manufacturers should be advised of the nature of the solvent hazard.

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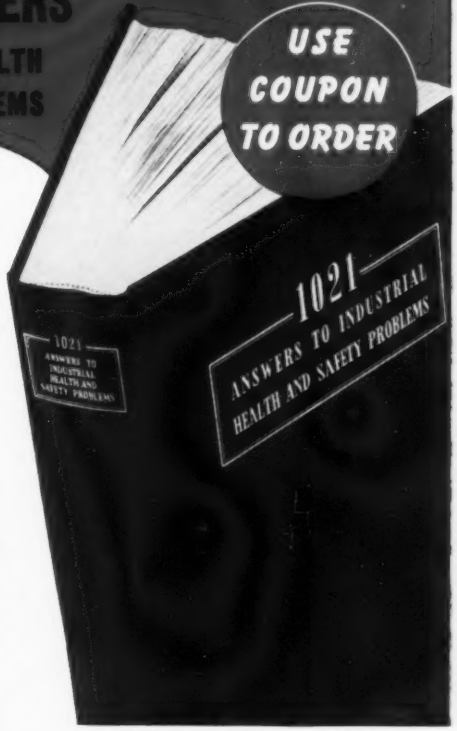

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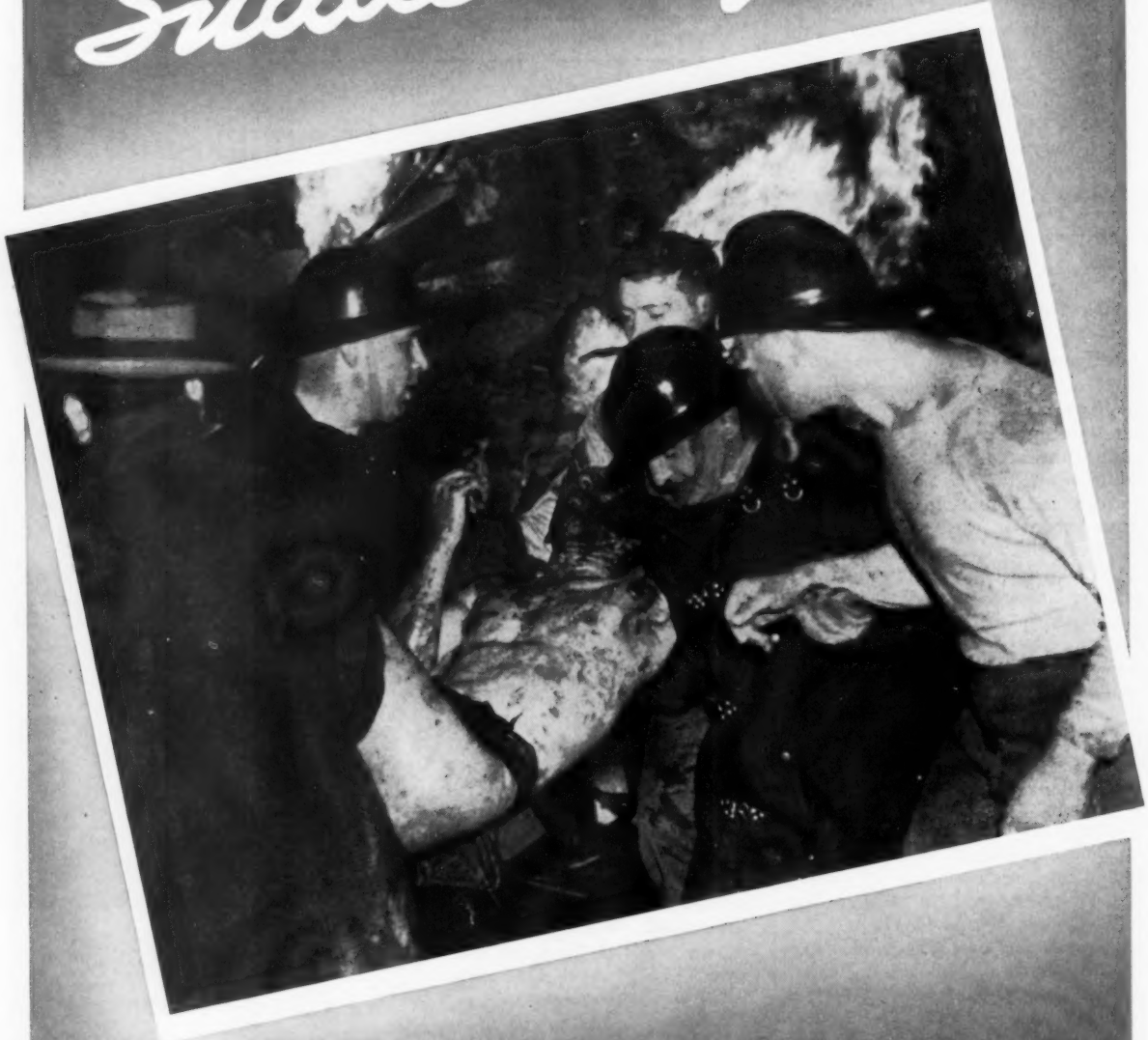

The clothing ripped from his body, an employee of a trucking company engaged in delivering flammable liquids to plants, is carried by firemen from the flaming debris resulting from a violent explosion. He died from the injuries.

AND SUDDEN INJURY

BILL opened the door on his side of the cab and looked back. "You got plenty of room, Mack," he protested. "Let's get this thing moving!"

Mack merely grunted to his helper and continued cautiously inching the big red tanker back into the alley.

Bill silently cursed. *If I were driving this rig, I'd show him,* he thought. *I could push it back faster than this!*

It was four o'clock in the afternoon now, and Bill knew it would take at least an hour to pump their load of asphalt-naphtha roofing compound from the truck into the big underground tank at the end of the alley. At the rate Mack was going, they'd be lucky to get out by five-thirty.

"This roofing compound is hot," Mack growled. "Take it easy with hot stuff if you want to stay healthy!"

What's the use, Bill inwardly groaned. Heaven and earth can't make the old boy move in a hurry.

"You ain't been on this job but a week," Mack went on. "One thing I don't go in for is preachin', but this I gotta say. We work every day with stuff the front office calls 'flammable liquids.' There are certain rules and regulations the front office lays down, and I hope you ain't forgot them already!"

"'Course I haven't!" Bill said. He hadn't forgotten them because he hadn't gotten around to reading them yet even though the man who hired him had given him a pamphlet and had said, "Read this carefully, Bill. They're important for your own safety and the company can't make money unless you stay healthy!"

Now Bill leaned against the truck and watched Mack double-check some connections. Someone called from the building and Mack said, "I'll be right back, kid. Everything is going fine, so don't monkey with nothin'."

Alone, Bill reached idly into his pocket and pulled out a cigarette. He wasn't thinking much about anything, when the match landed near one of the underground tank's access openings. In a way, Bill was lucky so much naphtha fume had leaked from the openings. The resulting explosion was so violent that he died without knowing how hideous he looked with his clothes blown off and his body completely seared. And he died without knowing that "No Smoking" was rule number one in the pamphlet he didn't read.

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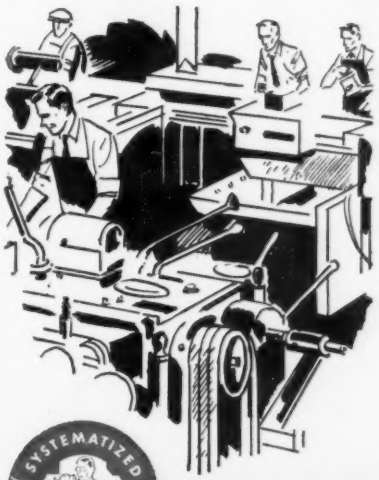

Actual plant figures reveal that Gerson-Stewart's simple plan of Systematized Sanitation will not only help lower plant maintenance costs, but will increase production and lower manufacturing costs as well. More effective use is made of your own plant-keeping personnel, and your plant becomes a safer, more orderly, more efficient place in which to work. Write today for complete information.

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Instrumentation News

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X-RAY ANALYSIS
From Page 11

were placed in a wooden frame, exposing about 200 square inches of surface. A vacuum pump was attached to the frame and approximately 20 cubic feet of air per minute was drawn through the filters. The filtering apparatus was set up at the operation and the air at the breathing level of the employee was sampled for about one hour.

In the laboratory of the Pittsburgh Testing Laboratory, the salicyclic acid layer was removed, dissolved in alcohol and the collected dust removed by filtration. The recovered dust was then suspended in alcohol and that fraction of dust less than five microns in size was removed from the gross sample by sedimentation. The dust less than five microns in size was then analysed by X-ray diffraction to determine the amount of free silica by weight.

Following are the results of tests given on February 19 and 20, 1947:

	Free Silica
1. Four feet inside loop of number 3 molding line, 8 feet from cope molding machine, about 50 feet from nearest shakeout. Most of the dust would come from sand that may have dried on flasks and what drifted in from other parts of the foundry. No dry parting compound is used.	16%
2. Inside of number 2 loop and seven feet from shakeout. The dust would come from the shakeout even though it is well exhausted, and other activity around the shakeout.	12%
3. First floor core room near sand muller. Considerable of the dust would come from handling of washed silica sand used in this mix.	19%
4. Second floor core room. Most of the dust would come from foundry sand handling equipment located on this floor, which is used in connection with the preparation of molding sand.	15%
5. Third floor core room between two Milwaukee core grinders. Source of dust would be from grinding to size of baked cores.	13%
6. Basement between No. 6 and No. 7 conveyor handling shakeout and overflow sand and eight feet south of barrel screen used for screening this sand. Sample would represent shakeout sand.	10%
7. Basement near core sand mixer. Most of the dust would come from washed silica sand used in making cores.	10%
8. Knockout room 35 feet from vibrating tables where cores are knocked out. Some of the dust would come from burned core sand and some from grinding of previously abrasive blasted castings.	12%
9. Shipping Department. Some of the dust would come from handling core mix, and from non-silica parting compound, and dry sand that adheres to molds.	13%

Samples containing 10, 12, 15 and 16 per cent free silica are representative of dust from molding and shaking out castings. Samples containing 10, 13, and 19 percent free silica are representative of dust from the making and grinding of cores. A sample containing 12 per cent free silica is representative of dust from knocking out cores and grinding castings.

For the past several years the Ferro Machine and Foundry Company *have made regular dust counts as a guide for the installation of exhaust ventilating equipment* and the providing of replacement air, a practice which is also followed by a number of other plants in Ohio. *In the foundry they are exhausting 350,000 cubic feet of air per minute* and replacing the same amount under positive pressure. They are handling approximately the same amount of air in the cleaning or mill room.

Early in 1946 they employed a doctor who is a lung specialist, and started taking X-ray films of all prospective and old employees. As a result they are now able to correlate silica exposure to the lung conditions of employees. With this all around program, it is well within the realm of possibility to eliminate all cases of disabling silicosis.

LETTERS TO THE EDITORS
From Page 5

set forth in the enclosed Safety Steps card. The supervisor is thoroughly trained and *sold* on the plan we have developed. This is the answer to enforcement—proper training and selling.

How in the name of good common sense can you develop good employee relationship by holding the threat of disciplinary action over a man. In actuality what you are doing is taking the negative approach; on the other hand, we are sure that in actuality you want at all times to use the positive manner.

You may say "Sure you have sold the supervisor, but not the employee. That in itself is a big problem and is one that will try, not only patience, but ingenuity and imagination as well. This problem has been resolved many times by Wilson & Co., Inc. not by enforcement, but by selling.

How do we sell an employee on safety equipment?

Let me give you an example of what recently happened in our plant, as a medium of illustration. You undoubtedly know that we are not only governed by the individual peculiarities of our raw materials, but also must comply with the Bureau of Animal Industries regulations. To this extent we are hindered with regulations not imposed upon other industries. In other words certain materials are not usable. In our industry one of the problems with which we have been faced is the problem of properly guarding our sharpening steels. The materials we had been using in trial (steel, aluminum, leather, fibre and rubber), were not acceptable due to the fact that they either presented a sanitary or edge dulling problem.

The solution was found in a test run with Plexi-Glass guards used in strategic spots in our Chicago Plant. Employees were highly pleased with the new guard, not only due to the fact that it did not have the dulling qualities of some of the metallic types, but due to the new material having real eye appeal. The appeal to the worker being from the sparkling jewel-like refractive qualities of Plexi-Glass. Rumors of a new type guard being tried for use in knife departments spread like wild fire. Knife operators requested the application of the new type guard to their equipment prior to our final approval of the new guard.

Again we wish to emphasize our thinking of not indicating a management weakness through use of disciplinary action; but rather the strength of management in our proper training approach, plus a selling point or two, to further strengthen our argument. — A. L. Schmuhl, Safety Consultant, Wilson & Co., Inc., Chicago 9, Ill.

Special thanks to Wilson & Co., Inc. for permission to publish this highly interesting letter from their Safety Consultant, Mr. Schmuhl.

FIRE PROTECTION FOR INDUSTRY

A SECTION IN WHICH ARE PRESENTED THE VARIED SPECIALIZED PROBLEMS AND SOLUTIONS TO FIRE FIGHTING CONTROL AND PROTECTION IN INDUSTRY

Table of Common Fire Hazardous Chemicals, Part 2 40
Foam Protection for Pump House 41
Electrical Hazards 42
School for Industrial Fire Prevention 44
Meet the Chief 46

Table of Common Fire Hazardous Chemicals

Part II

From a table Prepared by Committees of the National Fire Protection Association and American Chemical Society.

Tentatively adopted 1928, *adopted* 1929, *amended* 1931, 1935, 1938, 1939, 1941, 1942 and 1944.

NOTE. These columns are informative only; it is not considered necessary that the material be kept or stored only in the containers as listed, nor that each package be labeled. The requirements in the table on the storage of containers refer to chemicals in usual containers, and are not intended to apply to small bottles of chemicals such as are found in drug stores and chemical laboratories.

Name	Usual Shipping Container	Fire Hazard	Storage	Fire Fighting Phases
Borneol	Barrels, kegs, boxes and tins.	Combustible. Hazards similar to camphor.	Store in well-ventilated compartment or building.	See camphor.
Bromine	Glass Bottles; earthen jugs.	Causes oxidizing effect, resulting in heating and may cause fire when in contact with organic material.	Isolate; safeguard against mechanical injury.	
Bronze Dust	Barrels or boxes.	When aluminum is present forms flammable and explosive mixtures with air. Composition usually free from aluminum.		Smother with sand or ashes.
Butane	Steel cylinders.	Flammable gas under pressure. Classes with gasoline vapor in fire hazard.	Safeguard against mechanical injury.	
Calcium Carbide	Iron drums and tin cans.	Gives off acetylene gas on contact with water or moisture.	Store in dry, well-ventilated place in accordance with N.F.P.A. Standards.	Smother with sand or ashes. Do not use water.
Calcium Oxide	Wooden barrels and bags.	Heats upon contact with water or moisture and may cause ignition of organic materials. Swells when moist and may burst container.	Isolate; store in dry place away from water or moisture.	
Camphene	Tins.	When heated gives off flammable vapors. Classes with turpentine.	Isolate; keep in unheated compartment away from fire or heat.	Smother with sand or ashes. Avoid water.
Camphor	Tins and wooden kegs.	Flammable; gives off flammable vapors when heated which may form explosive mixture with air. Flash point 180° F.	Detach from other storage. Keep in well-ventilated room remote from fire.	Smother with sand or ashes. Chemical streams. Avoid water.
Carbolic Acid—see	Phenol.			
Carbon Disulphide	Small glass, earthenware, or metal containers packed in outside barrels or boxes (See I. C. C. Regulations). Steel drums, steel tank cars.	A highly volatile liquid with an offensive odor, giving off even at comparatively low temperatures vapors which form with air flammable and explosive mixtures. Flash point —30° C. (—22° F.).(3) Flammable range 1% to 50% (4) (upward propagation). The ignition temperature is dangerously low, being about 100° to 106° C. (3) (212° to 223° F.). It is endothermic, and the vapor may be ignited by a heavy blow. The vapors are heavier than air (vapor density 2.62), and may travel a considerable distance to a source of ignition and flash back. More hazardous than gasoline.	Isolate and safeguard containers against mechanical injury and metallic blows, and keep in unheated compartment away from sunlight and any source of ignition, including electric lighting fixtures and other electrical equipment. Storage tanks should be constructed over concrete basins containing water, and the carbon disulphide kept blanketed with water or inert gas at all times.	Heavier than water (Sp. gr. 1.29) and sparingly soluble in it. Use sand, carbon dioxide, or other inert gas as extinguishing agents. Cooling and blanketing action of water may be utilized in case of fires in metal containers or tanks. Total-flooding carbon dioxide systems may be employed for protection in storage rooms. Foam not effective. Do not use carbon tetrachloride. Use of gas masks or oxygen helmets of the type approved for the purpose by U. S. Bureau of Mines recommended.
Charcoal (Wood)	Boxes, barrels, bags, or bulk.	Spontaneously ignitable when freshly calcined and exposed to air, or when wet; hazardous when freshly ground and tightly packed.	Isolate; prevent dust accumulations; ventilate well; make daily inspections.	Use water, completely extinguishing the fire, after which the storage pile should be moved.
Chinese Wax	Burlap bags and wooden barrels.	Combustible.	Detach from other storage.	
Chlorine	Steel cylinders and tank cars.	Is not combustible in air but reacts chemically with many common substances and may cause fire or explosion when in contact with them. See remarks under "storage".	Isolate from turpentine, ether, ammonia gas, illuminating gas, hydrocarbons, hydrogen, and finely divided metals. Safeguard against mechanical injury of containers.	Use gas masks on entering atmospheres containing chlorine gas. If, however, concentration is high, or there is doubt as to the degree of concentration, use oxygen helmet of a type approved for such use by U. S. Bureau of Mines.
Chromium Trioxide or Chromium Anhydride CrO_3 (often called "Chromic Acid")	Iron drums and glass bottles.	Oxidizing material; will ignite on contact with acetic acid and alcohol. Chars organic material such as wood, sawdust, paper, or cotton, and may cause ignition. Combustible material in presence of chromium trioxide when ignited burns with great intensity. May cause explosion in fire.	Isolate.	Use water, completely extinguishing the fire, after which the storage pile should be removed.

(To Be Continued)

FOAM PROTECTION FOR PUMP HOUSE

This article describes a new method devised to protect pump houses from fire—one of the oil industry's major problems as pump rooms and manifold pits are considered the nerve centers of petroleum plant's operation.

Five foam makers, complete with overhead spray deflectors, protect the pump room in The Texas Company's at Port Arthur, Texas. Each unit is capable of producing approximately 270 gallons per minute of foam evenly dispersed over a circle approximately 14 feet in diameter. Designed to operate for 2¾ minutes, the system will put about 7½ inches of foam over the floor. Pumps and valves are effectively covered.

THE Texas Company recently installed in its Port Arthur gasoline pump house a foam system designed to spread a blanket of foam approximately six inches deep over the entire pump house and manifold pit area in less than three minutes. The new unit, can be operated manually or mechanically.

In the pump room at Port Arthur, the foam is delivered through overhead spray nozzles (see photo) so as to cover the tops and sides of all pumps and other machinery in the room, as well as the floor area around and between the units. In the manifold pit, the foam is introduced through floor deflectors as any fire in this area would be at the level of or under the piping. Thus, the foam is intended to not only extinguish the fire, but to protect surrounding equipment at the same time.

Several methods may be employed to produce the foam solution necessary for such an installation. Local conditions usually decide the method. In The Texas Company installation, a storage tank containing 80 gallons of the foam liquid and a rotary pump and motor with a capacity of approximately 29 gpm of foam liquid are provided. The pump takes suction from the liquid storage tank and discharges directly into the water stream which is at the rate of 454 gpm at 100 psi. The resulting fire-fighting solution of 483 gpm consists of 454 gpm of water and 29 gpm of the foam liquid, making a six percent solution, which is piped to the various discharge outlets spaced to give coverage over the entire protected area.

Foam floor protectors are part of the fire-protection unit in the manifold pit. Each deflector produces about 540 gallons of foam per minute, designed to flow over the entire floor of the room. Two and three-quarters minutes is required for the system's operation, which places slightly more than 6 inches of foam over the area.

(Photos: National Foam System, Inc.)

Inasmuch as there is no foam formed until the discharge outlet is reached, where air is entrained (ten gallons of foam per gallon of water), the lines may be small. And, as each discharge outlet acts as a meter, there need be no calculations of pipe sizes to assure equal distribution.

In the Port Arthur installation, it is simply necessary to open a 4" water valve and start the foam liquid into the water stream. However, this method may vary according to local conditions.

ELECTRICAL HAZARDS

Every manufacturing plant requires more or less continuing electrician service in the maintenance and repair of existing equipment, in installing new equipment, and in making the modifications and rearrangements involved in the ordinary course of plant enlargements, process changes and the like. As a rule, all of this work is handled by one or more fulltime plant electricians. The discussion has to do primarily with the electrical hazards connected with the work of these men.

IN REPAIR WORK on electrical circuits, there is always the hazard of electrication, or from traumatic injury due to being caught by machinery unexpectedly started. Very positive measures are necessary to prevent the unexpected energizing of the circuit. The best method is to arrange control switches so that they may be locked in the open position with the key in the possession of the person doing the work so that only he, or a person specifically designated by him, can remove the lock and close the switch. In case two or more persons may be exposed, the group leader should be given the responsibility of affixing the lock and removing it only when it is fully safe to do so. In many places a tag is placed on the open switch to show that men are at work on the equipment, but this is not as reliable as the use of locks, and is not recommended as a substitute. An even less reliable device is to block the switch open with a piece of wood. Even stationing a person at the switch with instructions to close it on signal is not always reliable because such signals can be misinterpreted and also, unless the person in charge is very careful to impress upon all concerned the importance of great care in such operations, unexpected slips are likely to occur with fatal results.

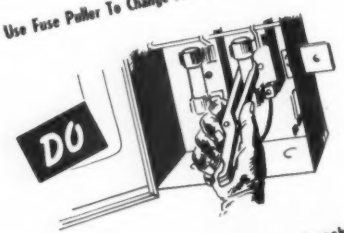
The planning for a given job will include, of course, decision as to what, if any, protective equipment is needed such as rubber gloves, insulating mats and the like, goggles or masks to give protection against flying objects or flashes, screens to protect others against flash from arc welding, or from flying particles if chipping or drilling is involved, properly safeguarded extension lights, etc.

Make Sure Line Is Dead Before Working On It—Avoid Injury

Lock control switch open, or prominently tag it, before working on line. As an added precaution it is often advisable to remove the fuses in the line, caring for them so that they will not be used by unauthorized persons.

DON'T work on the electrical line unless you are sure it is dead, and that no one will close the switch that energizes the line.

Use Fuse Puller To Change Fuses—Avoid Injury



Use an approved nonconducting type of mechanical fuse puller to remove and replace fuses, in order to avoid injury to the hands. Always open switch ahead of fuse panel, so that fuses will be dead.

DON'T remove and replace fuses with bare fingers. You may cut a finger on sharp corner of a clip or one terminal may be "hot."

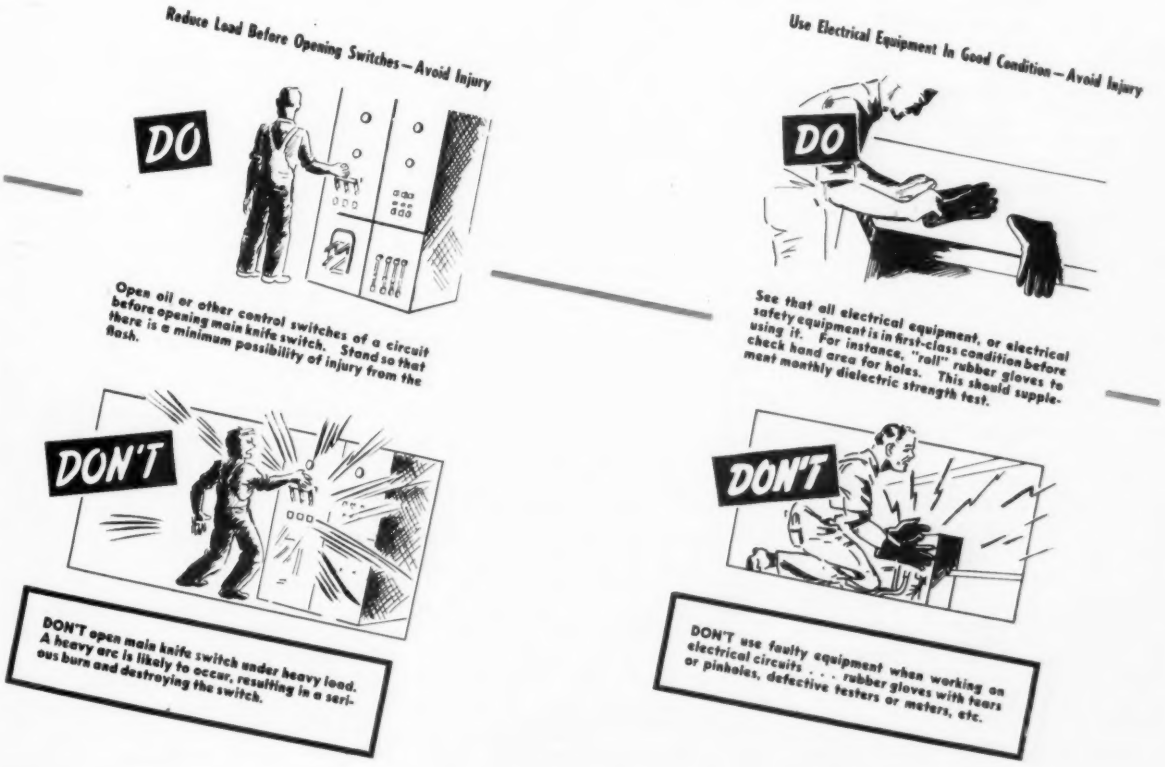
lights, etc. All of this material should be assembled at the start of each job and checked to make sure that it is in proper condition and available as needed.

The maintenance of electrical equipment in operating condition involves a considerable amount of routine testing and inspection. Effectiveness of the grounding of such equipment should be checked on a regular schedule depending upon conditions and the type of equipment involved. Control devices such as circuit break switches and the like require frequent inspections. Grounds—particularly those inside—should be checked for evidences of mechanical injury or corrosion. Earthed or driven grounds outside moy lose their effectiveness in spells of dry weather, hence they should be checked at such times. The hazard factor is always present in all work of this sort because there is always the danger of contact with uninsulated current-carrying parts and there is always the possibility of a part presumably grounded losing its ground and becoming live through an insulation failure. Safety in this work lies in the careful working out of safety procedures for all conditions involved and the faithful adherence to these procedures.

One troublesome hazard which usually is more of a fire than an accident hazard, results from the overfusing of circuits by unauthorized persons. If, due to overloading, fuses "blow" or circuit breakers operate frequently, the process workers are likely, if they can get access to them, to bridge them by various means. This causes overheating burnouts, fires, and the failure of insulation. The remedy, of course, is to provide circuits of capacity adequate to the maximum loads that will normally be placed upon them and in addition, it is frequently advisable to provide locked fuse boxes to prevent tampering by unauthorized persons.

In general, the attitude that should be followed in guiding all inspection work of this nature is to view it as preventive inspection. Inspection at its best keeps such close account of conditions as to permit the provision of additional or high-capacity equipment or the taking of other suitable preventive measures before trouble develops. Not only does this policy mean fewer interruptions to service, but it is also an important factor in preventing accidents.

(Continued to Page 47)


Reduce Load Before Opening Switches—Avoid Injury
DO
Open oil or other control switches of a circuit before opening main knife switch. Stand so that there is a minimum possibility of injury from the flash.
DON'T
DON'T open main knife switch under heavy load. A heavy arc is likely to occur, resulting in a serious burn and destroying the switch.
Use Electrical Equipment In Good Condition—Avoid Injury
DO
See that all electrical equipment, or electrical safety equipment is in first-class condition before using it. For instance, "roll" rubber gloves to check hand area for holes. This should supplement monthly dielectric strength test.
DON'T
DON'T use faulty equipment when working on electrical circuits . . . rubber gloves with tears or pinholes, defective testers or meters, etc.

The columns flanking the painting of a burning city show the fire loss in Detroit for each of the past ten years, each foot in height representing a million dollars.

SCHOOL FOR INDUSTRIAL FIRE PREVENTION

by
EDWARD W. HALL
Fire Marshal
Detroit Fire Department

Here is the story of the popular classes in industrial fire prevention conducted by the Public Relations Division of the Detroit Fire Department. Many industrial plants in and around Detroit have taken advantage of these classes which are being attended by industrial executives, safety directors and engineers, fire brigades, plant protection services and others interested in industrial fire prevention and protection.

FOR many years the Fire Prevention Bureau of the Detroit Fire Department has been working very closely with industry in the interest of fire safety. However, in the early stages of the war, as Detroit's industrial capacity and vital importance to the war effort became quite clear, it was evident that the prevention of fire in our many plants engaged in war production required intensification of our efforts and the full cooperation of both management and employees. Developments in industrial technology brought about by the manufacture of the implements of war resulted in many added and unfamiliar manufacturing hazards in materials, processes and finished products. Consequently, an elaborate system of plant inspection was adopted with frequent inspections made of all factories and shops which resulted in the elimination of many fire hazardous conditions.

In addition to the inspection procedure established, an educational campaign was started in the various plants, conducted by the Public Relations Division of the Fire Prevention Bureau. By means of programs arranged for the benefit of both management and employees, we attempted to implant the principles of fire safety and fire prevention. These programs consisted of talks, lectures, demonstrations, moving pictures, slides and slide films on the subject of industrial fire prevention. This personal contact served to acquaint us with management and, we believe, helped them to realize and appreciate the necessity for our intensified inspection program.

Although the end of the war meant the end of civilian defense and the curtailment of many of the other wartime activities that were designed to promote fire safety, our inspection schedule was maintained and we continued to arrange meetings throughout industry in the interest of fire safety. In fact, these meetings had become so popular that inquiries were being made regarding a fire prevention course which might be made available to representatives of various industries. As a result, in conjuction with the Detroit Industrial Safety Council, a well-rounded program was planned for the early part of 1947. The subjects and material were selected to directly appeal to industrial executives, safety directors and engineers, fire brigades, plant protection services and others interested in industrial fire prevention and protection.

The course was called "School for Industrial Fire Prevention" and six two-hour meetings were scheduled for consecutive Tuesday evenings commencing February 4, 1947. At the invitation of the Detroit Board of Fire Commissioners, the meetings were held in Fire Department Headquarters auditorium. Speakers selected from both the Fire Department and industry were chosen because of their ability in their particular fields. Lectures and discussions were augmented by demonstrations, motion pictures, slides, etc. Some of the subjects discussed included: Chemistry of Fire; Fire and Its Causes; Fire Extinguishers, Sprinklers and Standpipes; Flamma-

(Continued to Page 47)

SUN MON TUE THU FRI SAT
BUFFALO better-built
New Automatic Water Fire Extinguisher (B-11)
New Automatic Non-Freeze Extinguisher (C-11)
Buffalo "VL" Extinguisher

BUY THEM TODAY

TO STOP TOMORROW'S FIRE

● With fire losses mounting and replacement costs up, it's time to double-check your fire fighting equipment.

Is *every* vital location covered with the *right* type of extinguisher? Is every extinguisher freshly charged . . . ready for instant action?

Our representative in your locality has new stocks of Buffalo *better-built* Fire Extinguishers . . . a type and size for every fire hazard.

BUFFALO *better-built*

FIRE EXTINGUISHERS

ESTABLISHED 1895

BUFFALO FIRE APPLIANCE CORPORATION

DAYTON 1, OHIO

MEET THE *Chief*...

OCCUPATIONAL HAZARDS will bring to its readers as a regular feature each month the true, inside story of an industrial fire, stressing HOW AND WHY IT HAPPENED. Each story will be told by the man who heads the fire department of a large city. These authentic accounts by men who devote their lives to fighting fires and to the study of fire hazards are presented to the readers of OCCUPATIONAL HAZARDS with the belief that they will be of value to fire protection men in industrial plants throught the country.

FIGHTING FIRES WITH WETTER WATER

by
CHIEF PAUL P. HEINZ
New Haven Fire Department

Our guest writer of the month is Chief Paul P. Heinz who heads the Department of Fire of the City of New Haven, Conn. Chief Heinz, as can be seen by the topic of this article, is constantly on the alert for new methods to combat fires. He was made Chief in 1941, and is President of the Connecticut Fire Chiefs Association, President of the New England Division of the International Association of Fire Chiefs, and is a member of the Governors Committee on Fire Safety and Control for Connecticut.

A SHORTAGE of billard balls eighty years ago started a procession of events that gave our country an industry which in 1947 will have reached billion-dollar proportions. Back in the 1860s the world supply of ivory had fallen so low that the makers of billiard balls, threatened with extinction, offered a $10,000 prize to anyone who could produce a satisfactory substitute for the natural material. The combined efforts of Alexander Parkes, an Englishman, and John Hyatt, an Albany printer, brought forth a plastic substance composed of nitrocellulose and camphor, and gave the world not only the first synthetic billiard ball, but the first commercially accepted plastic. Today the plastic industry is one of the nation's giants.

The curiosity of a physical chemist regarding the application of the theory of surface tension to the spreading and penetrating properties of liquids began another train of developments, a by-product of which is likely to become one of the most potent weapons in the armamentarium of the fire-fighting profession, as well as a highly effective addition to the equipment of the industrial specialist. For many years numerous methods were employed in the bleaching, dyeing, leather tanning and other fields to overcome the cohesive characteristics of liquids which tended to interfere with the essential processes of these industries. To a large extent the results which were obtained had their basis in various father-to-son secrets and rule-of-thumb formulas involving the use of "stabilizers", "modifiers", "homogenizers", etc., but there was little real understanding of the functions of these additives. With the spread of knowledge concerning surface tension during recent years, however, the significance of the action of specific ingredients began to be understood. The advantage arising out of these investigations have been realized in many lines of endeavor. Known as surface active agents, or wetting aids, these substances, when added to a liquid reduce the cohesiveness of its molecular structure and thus increase its penetrating powers. They have vastly enhanced the affinity of fabrics for bleaching and dyeing solutions; they are used by manufacturers of pharmaceuticals to promote contact, or mingling, of incompatible elements in emulsions; and inevitably, they have found application in the fire-fighting services.

Wetting agent solutions, or "wet water", as the fire services say, will, in general, do a better and speedier job on any fire where plain water may be used, while in some cases, such as in fires in closely packed materials like overstuffed furniture, baled cotton or paper, hay, sawdust, etc., the results are little short of spectacular.

On June 10, 1940 the New Haven Fire Department was called to a fire in a storage plant containing a large quantity of scrap paper in bales. We fought the blaze with ten solid streams for several hours, and then our men put in the better part of a day breaking open hundreds of bales of paper and knocking out the fire hidden in them. We were obliged to return to the scene half a dozen times during the following week to take care of subsequent outbreaks. By a curious coincidence, we had another fire at this location on June 10, 1946, just six years to the day after the first one. This time we had wet water. Not only were we able to do a record job on this visit, but

we did it all on the first call, without overhauls or rekindles.

On June 29, 1946 we answered an alarm from a warehouse of the N. Y. N. H. & H. Railroad. The fire was in a 400 foot storeroom wherein letterheads, forms, tickets, envelopes and other items of stationery were piled in row upon row. Here our men knocked the fire down with 2½ inch lines in fairly short order, then they soaked the remains with fog sprays containing a 1% wet water solution. If this storeroom had been equipped with sprinklers using wet water, I venture to say we would have found the fire out when we arrived.

I believe the time is at hand when industry should investigate the possibility of introducing wet water into automatic sprinkler systems. Earlier problems relative to oxidation, stability, etc., have been largely overcome, so that there remains only the question of the extent to which the solution may be used. It is my opinion that roof-mounted tanks containing a predetermined-strength solution may be piped through to building areas of special hazard, or small auxiliary tanks could be installed, with mixing chambers and proportionating valves, so as to permit combining wetting agents, with the regular supply lines.

With its record of good housekeeping practices and thoroughgoing preventive procedures, industrial management should not fail to look into the advantages of wet water.

ELECTRICAL HAZARDS
From Page 43

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to the hand tools used on electrical work. So far as possible, handles of such tools should be of insulated material, or protected by effective insulation. For example, many electricians bind the handles of their pliers with tape. This insulates and provides a better grip, and if properly maintained, is satisfactory for most conditions. It is not an adequate substitute for rubber gloves in work on live circuits, but when contact is unexpectedly made with ordinary voltages, such insulation is very likely to mean the difference between a serious injury and no injury.

Electricians are skilled workers and like most skilled workers have learned their trade through formal apprenticeship courses or by being assigned as helpers to qualified electricians. However, formal training in safety has not yet become general or thorough enough so that we can reasonably assume that electricians as a class need no further training in safe procedures. They frequently have unsafe habits of work without realizing it. Many of them take chances knowingly in the belief that they can "get away with it." However, the accident record of this type of work does not justify any such attitude on the part of any electrician. Therefore, the responsible head of every plant employing electricians should see that careful attention is paid to their work practices and whatever training and instruction they may need for safety, should be given. The injury rate for plant electricians as a class is high. In plants where thorough attention is given to safety their injury rate is low. It could be low in all cases.

—Division of Labor Standards, U. S. Department of Labor.

FIRE PREVENTION SCHOOL
From Page 44

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ble Liquids; Exits, Fire Doors, Firewalls and Structural Codes; and Electrical and Welding Hazards.

The meetings were well attended in spite of the fact that the weather on several of the evenings scheduled was the most severe of the winter. An average of some three hundred fifty men were present at each meeting, some of them traveling a distance of sixty to a hundred miles. At the conclusion of the course, an engraved certificate of attendance was presented by the Detroit Industrial Safety Council to all those who had completed the course.

Because of the interest manifested by all concerned and the recognized value of the course, it was decided to make the school an annual affair. Arrangements have already been made to hold a similar school during February and March of 1948 with additional subjects to be discussed by different speakers. Based on the attendance at the meetings this year, it is confidently expected that the attendance at the meetings in 1948 will tax the capacity of Fire Headquarters auditorium.

Clean Out the Fires

ARE YOUR premises securely protected from the ravages of fire, or are there potential hazards that should be corrected? Make an inspection, using as your guide the following questionnaire:

Are there any accumulations of waste, flammable material or rubbish on your premises?

Are your storage rooms clean?

Are approved waste cans provided for oily or greasy waste material?

Are waste cans emptied daily after closing hours, and is waste material properly disposed of?

Are there any broken windows, plastering, partitions, flooring, or other similar defects?

Are any aisles obstructed?

Are any entrances obstructed?

Are there any open flame lights or electric light bulbs near combustible material?

Are any electric fuses replaced by wire or other improper current-carrying materials?

Are there any violations of smoking rules?

Are precautions taken when tanks are filled with flammable liquids?

Are fire extinguishers inspected regularly?

Is the fuel supply safely stored?

Are proper precautions taken to isolate storage of combustible stock?

These items are saboteurs and we must do away with them. They are dangerous and cost thousands of man-hours, cost temporary and permanent disabilities, increase production costs, and make for unsafe and unsanitary working conditions.

ELIMINATING THE CAUSE IS THE BEST FIRE EXTINGUISHER.

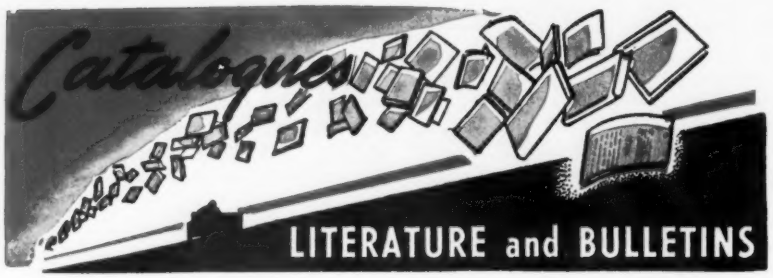
—Stanolind Safety Aid

Booklet for Watchmen

The Associated Factory Mutual Fire Insurance Companies have prepared a booklet entitled, *FIRE! Watchman—What Would You Do?*

This booklet is exceptionally well prepared and outlines eight basic steps for the watchman to follow should he discover fire in the plant. Each step is cleverly illustrated and accompanied by copy that is informative and clear. The booklet points out that if each of the basic eight steps are carried out by the watchman he may be able to prevent a serious fire in his plant. The basic steps as outlined in the booklet are as follows:

1. Use extinguisher if fire is small.
2. Sound the alarm immediately if there is any chance that the fire might get out of control.
3. Be ready to direct firemen to the fire.
4. Make sure sprinkler valves are open.
5. Be sure fire pump is in operation.
6. Call key plant officials.
7. Know when to turn off sprinkler system.
8. Stand by valve ready to turn system back on should fire burst into flame again.



The publications featured on these pages were written by experts. They may be obtained without charge. To obtain these use the postcard bound into this issue.

FL-175 . . . The Bellows Company have prepared a 14-page booklet on their "Controlled - Air" Powered Devices. These power units are said to take the "human element" out of the job and cut operator fatigue to a minimum.

FL-176 . . . The 15 most urgent building maintenance problems are illustrated and discussed in a colorful, informative folder prepared by the Stonhard Company that will prove of interest and value to every plant owner, engineer and maintenance man. Included in this practical guide are the solutions to such problems as leaky roofs; worn flashings and gutters, rough concrete and wood floors, concrete dust, spalled walls, loose pointing, etc.

FL-177 . . . An interesting eight page booklet in color has been prepared by Surface Combustion Corporation entitled, "Control Humidity if you want to get the most from Comfort Air Conditioning." The booklet describes how excess humidity in the atmosphere is responsible for the chill, shock and clamminess often experienced in ordinary air conditioned places.

FL-178 . . . The new "Rainy Night" booklet just released by The Edwin F. Guth Company emphasizes the importance and value of good lighting by pointing up the effects of bad lighting. It defines the symptoms and describes the hazards of bad lighting with carefully drawn illustrations of driving on a dark rainy night. This attractive, full-color booklet contrasts the detrimental effects of poor lighting with the benefits of good lighting in a way everyone will quickly understand.

FL-179 . . . The Industrial Products Company have prepared a new bulletin describing their complete line of attractive, durable and economical porcelain enamel accident prevention signs. These signs are built for service. Made of 18-guage ARMCO IRON, they are provided with necessary holes for mounting.

FL-180 . . . M. L. Snyder & Son have prepared a 70-page catalogue presenting their complete line of rubber gloves, aprons, boots, hose, clothing and miscellaneous articles. Most of the articles described in the catalogue are accompanied by photographs or illustrations so that the reader can form a complete picture of each product.

FL-181 . . . A folder by the Buckner Process Company describes their product, LION PAW safety mats and stair treads. It is described as being different than any other type floor covering as the product is a matting of impregnated interwoven cotton matting said to be long wearing, non-slip, oil and waterproof, non-static and easily installed over wooden, cement, steel, concrete or tile surfaces.

FL-182 . . . A new 12-page Schmieg Centri-Merge Swirl Type Dust and Fume Eliminator Folder has been recently prepared for Schmieg Industries by Alfred B. Caldwell. The folder is attractively prepared in several colors and includes complete blueprint layouts for various dust and fume control installations.

FL-183 . . . A new 40-page catalog has been published by the Fibre-Metal Products Co., showing a large, diversified line available of welding helmets, hand shields, electrode holders for electric or carbon arc, a weld-probing machine, protective clothing, welding cable, cable connector, etc. Also included are descriptions of the new line of scalemaster weld-cleaning hammers and scratchmaster steel wire brushes.

FL-184 . . . The Air-Bob Division of the Union Supply Company have prepared literature describing their Air-Bob rubber insoles and their Air-Bob rubber resoling Equipment. The manufacturer points out that the rubber insoles provide for cooler comfort, non-skid protection and economy.

FL-185 . . . "Uniforms for Women" is the title of the folder recently prepared by the E. R. MOORE CO. Featuring sanforized-shrunk fabrics and careful workmanship, the dresses, slack suits, shirts and coveralls are designed to afford women industrial workers sturdy, attractive and comfortable wearing apparel while on the job.

FL-186 . . . A. E. Halperin Co., Inc., have prepared a 36-page catalogue, "Halco Industrial First Aid Supplies and Safety Equipment." The catalog includes a complete line of surgical dressings and pharmaceuticals, including a variety of first aid kits (large and small), refills, supplies and equipment.

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NOW —an important NEW WEAPON against insidious CO!

THE M·S·A Colorimetric CARBON MONOXIDE Tester

● Uses indicator tubes developed by National Bureau of Standards ● Fast and simple in operation ● Weighs less than a half-pound ● Meets the most stringent safety requirements ● Anyone can use without special training

Incorporating the most advanced developments in colorimetric determination of carbon monoxide hazards, this new M.S.A. instrument indicates CO in air from 0.001 to 0.10 per cent by volume. Each tube contains its own scrubbers for eliminating the effects of most other atmospheric contaminants. A simple comparison of color change in a chemical detector tube with an integral color scale clearly indicates the various carbon monoxide concentrations encountered.

Adapted to surveys of industrial atmospheres, mine ventilation currents, garages, bus terminals, interiors of aircraft, passenger cars, trucks and buses, blast and open hearth furnace operations, public utility manholes and conduits, manufactured gas plants—and, in fact, wherever low but toxic concentrations of CO are potential hazards—the M.S.A. Carbon Monoxide Tester meets the long-expressed needs of public utilities, industrial hygienists, aircraft flight test engineers, mine inspectors, and others concerned with the problems of CO.

Sturdy in construction and easy to handle, the M.S.A. Colorimetric Carbon Monoxide Tester is furnished complete in leather carrying case with 12 detector tubes; the tubes may be stored for at least a year without deterioration. Ask your nearest M.S.A. representative for an actual demonstration.

Heart of the Tester is the special detector tube. To use, sealed tube tips are broken off . . .

. . . and tube is inserted beside revolving color scale. A few aspirations of bulb, and test is completed.

WRITE FOR DESCRIPTIVE BULLETIN DS-4

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This issue marks a milestone in the life of OCCUPATIONAL HAZARDS Magazine. The end of our first year in the larger sized book . . . .

This addition of space has made possible a more complete magazine for the plant men responsible for safety, health or fire protection.

We have, for example, enlarged our "Right off the Docket" section, one of the most popular features in the book. We've added a complete Fire Protection section which appears each month. Among the features in this section are the popular "Meet the Chief" series, in which leading fire chiefs from all over the country express their views on industrial fire protection. Our sensational series of photos entitled "And Sudden Injury" are being posted on hundreds of plant bulletin boards. "Accidents in the News" bring true accounts of industrial accidents to the readers.

These are only a few of the features that cause our readers to say "OCCUPATIONAL HAZARDS is the best safety magazine I get!"

NOV 30 1948